The RUBBER AGE

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LATE NEWS of the Industry

Suspicion of Dumping Stops Imports of Footwear and Stearic Acid

Protests of Local Manufacturers Before the Tariff Commission Bring Results—Bonds Imposed on Cheap Stearic Acid and Rubber Footwear Imports — Work-Sharing Plans Inaugurated in Akron Rubber Plants

ORDERS of "suspicion of dumping," requiring a 100 per cent bond from the importer, are expected to be issued shortly against imports of stearic acid from The Netherlands and waterproof rubber footwear from Czechoslovakia.

This announcement, made by Frank Dow, Acting Commissioner of Customs, followed a hearing in which the domestic stearic acid industry presented evidence to show that dumping was being practiced to the detriment of the American producers.

Similar evidence was adduced recently against Czechoslovak rubber footwear, as well as similar products from Japan. An order against the Japanese imports may come after conclusion of further hearings.

Mr. Dow said the bonds would be required pending an investigation to determine whether the provisions of the anti-dumping law should be invoked.

Stearic acid has been delivered into this country from Russia at 3.2 cents a pound and from The Netherlands at 4.8 cents a pound, as contrasted with the American production cost of 7½ cents a pound, according to the evidence.

Manufacturers of rubber boots and shoes in Akron and elsewhere throughout the country see in President Hoover's demand for adequate tariff protection against foreign dumping a rehabilitation of their industry and safeguards for American workingmen against cheap labor overseas.

The tariff commission has before it a list of 18 industries in 30 states for investigations into adequacy of existing import duties, including rubber boots and shoes, and chemicals, both of which are products to some extent in the Akron territory.

James D. Tew, president, B. F. Goodrich Company, declared that "unless changes are made in the laws to protect American-made products, now replaced to a great extent by foreign manufacturers, 25,000 American wage earners will be deprived of work."

Spokesmen for the other rubber concerns have expressed the opinion that their products might withstand the dumping that is being practiced by foreign manufacturers, principally Japanese, but they were watching closely efforts of the Washington government to safeguard industry that is vulnerable in the face of the low standard of living in some foreign countries, and consequent low cost of manufacturing articles that are pouring into America.

As an example of the price differential in favor of imported rubber footwear products, trade interests state that a standard line of men's canvas tennis shoes of Japanese manufacture is sold by a leading chain store at 20 cents a pair, retail, whereas the domestic product of similar quality has a factory cost of 29 cents a pair, including only costs of production and pro rata share of factory overhead and factory selling expenses, exclusive of retail selling costs. Similarly, Japanese women's sandals are sold to large distributors at 24½ cents a pair, after duty and all shipping expenses, while the comparative domestic product has a factory cost alone of slightly over 40 cents a pair.

A further instance cited by rubber interests is offered by women's gaiters of Czechoslovakian manufacture which are sold by wholesale distributors in this country at 42 cents, net, a pair against a factory cost of 72 cents a pair for the comparable domestic product.

Approximately 90 per cent of all rubber footwear imports are Japanese and Czechoslovakian products. Rubber experts attempting to determine the factors causing the apparent sharp discrepancy in costs of production in those countries and in the United States believe that the explanation lies principally in low wage rates and, in the case of Japan, from the competitive advantages in foreign markets arising from depreciation in the value of the yen from par of about 50 cents to about 22 cents currently.

With Japanese labor costs already low, it is claimed this depreciation has further reduced wage rates there on the basis of the American dollar to about 23 cents a day for female workers and to about 46 cents a day for male workers in the Japanese rubber footwear industry. In Czechoslovakia, where no competitive advantage exists from the standpoint of foreign exchange rates, the average daily wage rate for rubber workers is estimated at a maximum

of $1. In contrast to these labor costs for foreign producers average daily wage rates in the rubber footwear field in the United States are about $2.85 for women and $4.60 for men on the basis of the eight-hour day.

Rubber leaders contend that unless adequate protective measures are taken against imports of foreign producers, the market for domestic products will virtually collapse. They favor, in addition, a system of valuation for tariffs based on United States currency to avoid the advantage incurred by some foreign nations through deflated exchange. Similar inroads on the domestic market have developed this year through imports of beach balls and rubber toys despite the present tariff of 70 per cent it is claimed.

Outselling the attempts of the American Government to restrict imports of cheap rubber, according to advices received in the trade yesterday, the Government of Czechoslovakia has placed a temporary ban upon the importation of rubber shoes manufactured in the United States. The action was taken as a retaliatory measure for the antidumping measures taken in this country against Czechoslovakian shoes. Czech manufacturers of rubber goods also have demanded that tires of American manufacture be barred out of the country.

Work Sharing Plans Are Extended Throughout Akron Rubber Factories

WIDESPREAD increase in "share-the-work" movement that is being promoted nationally to stimulate buying power and check unemployment, was predicted for Akron during the winter.

P. W. Litchfield, president, Goodyear Tire and Rubber Company, chairman of the committee of the United States Chamber of Commerce that is sponsoring the plan, and T. G. Graham, vice-president, B. F. Goodrich Company, chairman of a six-county committee in the Fourth Federal Reserve bank district supporting the idea, explained "share-the-work" movement in detail.

Goodyear has reduced working hours for most of its employees to a maximum of 18 hours a week, Mr. Litchfield said, in an effort to put his plan into operation, and that hours of the office force there had been reduced so that in the last 30 days about 10 per cent increase was noticeable in that group.

Mr. Graham urged cooperation of employers, no matter in what capacity. The zone over which he is general chairman includes Summit, Portage, Medina, Stark, Tuscarawas and Harrison counties, and just now Graham is completing working personnel of a sub-committee for each county, to push the "share-the-work" project.

The Goodrich company is working now on a basis comparable to the plan Mr. Litchfield advocates, Mr. Graham said, and to help the situation had assisted 750 employees in carrying out of the garden project during the summer, that had produced $25,000 worth of foodstuffs.

Principal objectives of the "share-the-work" movement, Graham said, are:

1—To check upward trend of unemployment.

2—To decrease unemployment by a wider spreading of present available work.

3—When an increasing volume of business permits increasing working personnel, to accomplish the same result by distributing the work to the greatest number of men and women, rather than by working longer hours.

S. G. Carkhuff, secretary, Firestone Tire and Rubber Company, and William O'Neil, president, General Tire and Rubber Company, declared their companies have had the "share-the-work" plan in operation for some time.

General Tire Increases Sales—O'Neil Gives View on Protective Tariff Policy

UNIT sales and production of the General Tire and Rubber Company during the first three quarters of the present fiscal year were higher than in any corresponding period in the history of the company, according to a recent statement of William O'Neil, president of the company.

"Any increase in the price of crude rubber will mean another increase in the price of tires," Mr. O'Neil said. "With increased demand, an increase in the price of crude rubber is bound to come.

"While the recent tire price raise involves only a small amount of additional cost to the car-owner, it is important because it is the first price raise since 1925.

Our company has found no lessening in the demand for tires. On the contrary, General has made and sold more tires in the first three quarters of the present fiscal year than during the same period in 1931. Unit sales so far this year have been well ahead of any other year since our company was organized seventeen years ago.

"I can see no need at this time for increasing the tariff on automobile tires, as the present tariff, which is purely nominal, is sufficient.

"Although I am a protectionist," said Mr. O'Neil, "I do not like to see higher tariffs. I feel that the whole question of tariffs should be delegated to a permanent, non-political commission with full power to act. I do not believe that tariffs are properly the subject of congressional action.

"The Hawley-Smoot Act taxed French lace and France retaliated with a 100 per cent duty on automobiles and automobile parts. The automobile industry in this country protested and the lace tariff was reduced, but the French levy on automobile imports still remains."

Litchfield Favors Flexible Duty To Promote and Not Retard Trade

THAT a flexible tariff on tire imports may easily become an essential to welfare of this country's rubber industry was intimated by P. W. Litchfield, president of Goodyear Tire and Rubber Company and chairman of a special committee named by the United States Chamber of Commerce to make recommendations regarding shorter work periods in business and industry to spread employment.

"An ideal tariff is one that promotes rather than retards international trade," Mr. Litchfield observed, "one which properly safeguards national interests and builds up within a country the industries necessary to support life and adequately provides for the defense of that country.

"In these days of a spirit of nationalism spreading in all countries of the world, they are constantly increasing their tariffs against American goods, and in many cases their tariffs are far in excess of those imposed by America on similar articles.

"The rubber footwear industry in this country, which formerly did a large export business, has suffered severely in recent years, and at the present time our home market is at the mercy of cheap foreign products.

"The foreign markets on tires have been seriously curtailed for similar reasons, and only by building branch plants in foreign countries have we been able to retain the business which we formerly had. A flexible tariff on tire imports may very easily become the only protection to our domestic tire markets under present worldwide economic conditions, and the only safeguard which the rubber workman may have for his job."

(Other news of the industry will be found on Pages 97-101)

The Effect of Particle Size of Zinc Oxide on the Physical Properties of Rubber

By G. S. HASLAM*

ABSTRACT

THE particle size of the pigment may be expressed in terms of several average diameters depending on the method of measurement. In this work three of these averages were considered; namely, d_1 which is the arithmetical mean, d_3 which is the average diameter from which specific surface is calculated, and D which is the average diameter from which the number of particles per gram is calculated.

A series of samples was prepared and these three average diameters were determined. These samples were then compounded with rubber and several physical properties measured.

As a result of these tests it is shown that, in general, the physical properties vary directly as the specific surface and the number of particles per gram. However, if the number of particles per gram is maintained constant and the specific surface is varied, it was found that the physical properties vary directly as the specific surface. No such relationship was found when the specific surface was maintained constant and number of particles per gram varied.

It is further pointed out that the only satisfactory means of measuring the d_3 diameter and, therefore, the specific surface is by some microscopic method which determines the size distribution curve for the pigment.

THAT the particle size of the pigment is of primary importance in determining the physical properties of a highly pigmented rubber compound has long been recognized. Due to the technical importance of a knowledge of particle size, several methods have been proposed for its determination. Unfortunately, however, not all of these methods are designed to measure the same average diameter, and some confusion exists from an occasional failure to define clearly the average diameter which has been measured. There are several average diameters all of which are functions of the uniformity of the pigment, and even in products that are reasonably uniform there are often significant variations among them. If all the particles in the sample are of the same size, these several averages will be equal, but if this is not true, the average diameter which measures specific surface, for instance, will be different from the one which measures the number of particles per gram.

A lengthy discussion of the several average diameters and their significance is not warranted here, as the subject has been very extensively covered by Perrot and Kinney[2] and later by Green[3]. For the purpose of this paper a brief resumé of the significance of three of these diameters will be given.

"d_1," is the arithmetic mean diameter and may be determined by any method of direct microscopic observation[4] or projection[5] or by the photomicrographic method[6]. The diameter of a large number of particles is measured and the average $\frac{\Sigma nd}{\Sigma n}$ is calculated.

The "d_3" diameter, which is the diameter from which specific surface is determined and the specific surface, may be calculated from the data obtained by the above mentioned methods by use of the equations $d_3 = \frac{\Sigma nd^3}{\Sigma nd^2}$ and $S = \frac{6}{\rho d_3}$, where S is specific surface in square meters per gram, ρ is the density of the pigment in grams per cubic centimeter and d_3 is in microns.

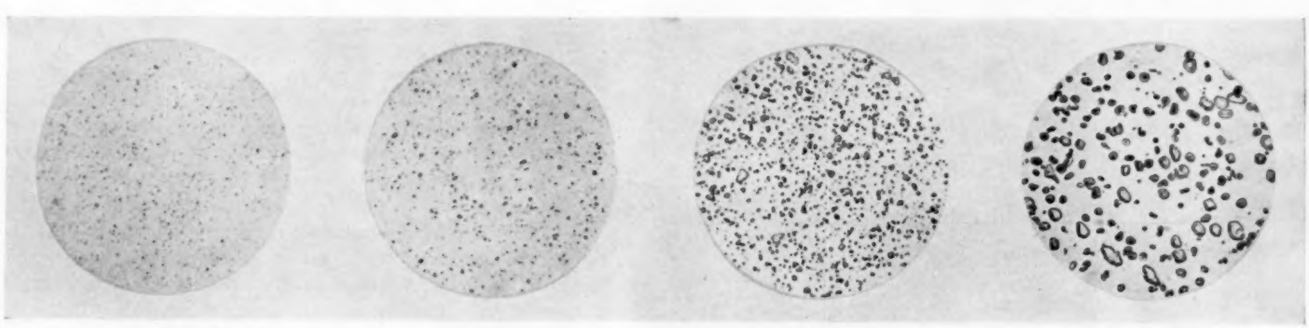
The "D" diameter, which is the diameter from which the number of particles per gram is determined, and the number of particles per gram, may also be calculated from these data by use of the equation $D = \sqrt[3]{\frac{\Sigma nd^3}{\Sigma n}}$ and $N = \frac{1}{\rho D^3}$ where ρ is the density of the pigment in grams per cubic centimeter and D is in centimeters.

The count method proposed by Gehman and Morris[1] measures N and thus D directly and quite satisfactorily. No method of determining "d_3" by measuring specific surface directly has been advanced that gives really satisfactory results. Methods involving the measurement of adhesion tension[7] and absorption[8] offer certain possibilities but theoretical uncertainties have made these methods unreliable so far.

It is possible that the count method will give results that are a better measure of the absolute value of particle size than the photomicrographic method, but in order to carry out this investigation it was necessary to use a method which permitted the determination of the several average diameters. It is felt that if the "d_3" diameter

*Investigator, Research Division, The New Jersey Zinc Company, Palmerton, Pa.

Paper presented at Denver, Colo., meeting of Rubber Division A. C. S., August, 1932.



Sample A Sample B Sample C Sample D

FIGURE 1

as measured by the photomicrographic method is high, the "D" is also high, so that the relation between these two diameters, as shown, is correct.

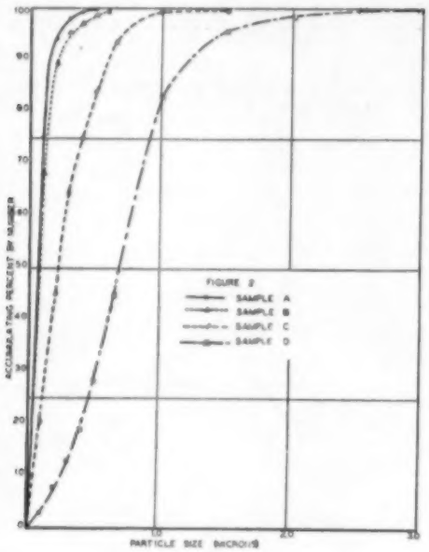


FIGURE 2

It is quite obvious that unless the physical properties of rubber which are considered functions of the particle size of the pigment follow the measured diameter, the method is of little significance. It is the purpose of this investigation, therefore, to establish which of the three above mentioned diameters, d_1, d_3 or D, governs physical properties most closely and how great will be the error if an average diameter other than the correct one is used.

For this purpose we have selected four samples of zinc oxide which will be shown as Sample A, B, C and D. These materials, for all practical purposes, have the same chemical analysis, the same particle shape characteristics and approximately the same degree of uniformity. The principal variation therefore is particle size.

In Figure 1 are shown the photomicrographs of the four samples

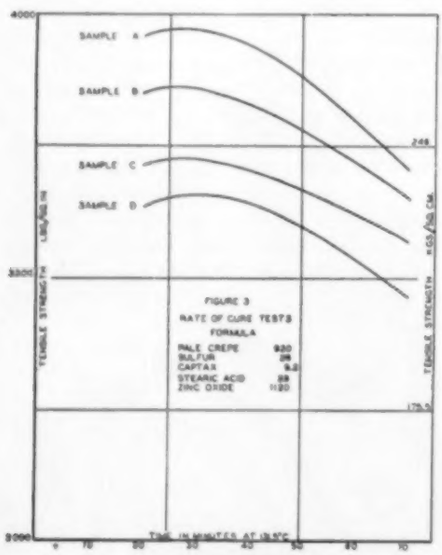


FIGURE 3

of zinc oxide from which the particle size measurements were made. In the case of the finer oxides, A and B, ultra-violet light was used in the photomicroscopy in order to get the best possible resolution. This was not considered necessary in the case of the coarser oxides as shown by the work of Haslam and Hall[9]. Three separate measurements were made on each sample, taking one photomicrograph of each of three samples of A and B and two of each of the three samples of C and D, so that in all cases at least one thousand particles were measured.

In Table 1 are shown the results of each of the three determinations as well as the average. The average size distribution of the pigment particles is shown in Figure 2.

Table 1

	A	B	C	Average
Sample A				
d_1	.134	.132	.130	.132
d_3	.228	.202	.200	.210
D	.173	.162	.160	.165
Sample B				
d_1	.146	.154	.147	.149
d_3	.286	.300	.293	.292
D	.204	.214	.206	.207
Sample C				
d_1	.337	.345	.349	.343
d_3	.684	.725	.711	.707
D	.490	.519	.507	.502
Sample D				
d_1	.868	.880	.871	.873
d_3	1.385	1.434	1.353	1.382
D	1.108	1.138	1.110	1.100

These four samples were then tested for rate of cure in a Captax formula containing 20 volumes of pigment and the results are

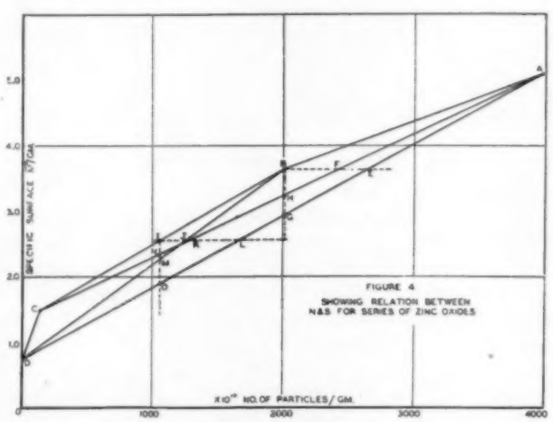


FIGURE 4

shown in Figure 3. These curves show clearly that there are no differences in the curing characteristics of these four oxides. The cure of 25 minutes at 131° C. was used throughout. The differences in optimum tensile are, of course, a function of particle size and show the range attainable with zinc oxides which vary only in that respect.

It was originally intended to consider three average diameters, d_1, d_3 and D, but calculations made to determine the variation in d_1 when several mixtures of these four oxides were made showed that the value d_1 was of no significance. For example, a mixture of 68 per cent of Sample A which has a $d_1 = .132\mu$ and 32 per cent of Sample D which has a $d_1 = .873\mu$, had a d_1 average diameter of $.133\mu$*. The reason for this anomaly is that the arithmetical mean is so very markedly affected by the number of fine particles present, that the addition of 30 per cent by weight of extremely large particle size material to a fine pigment does not appreciably change this value.

*Methods of calculating the average diameter of mixtures are given by Green (3).

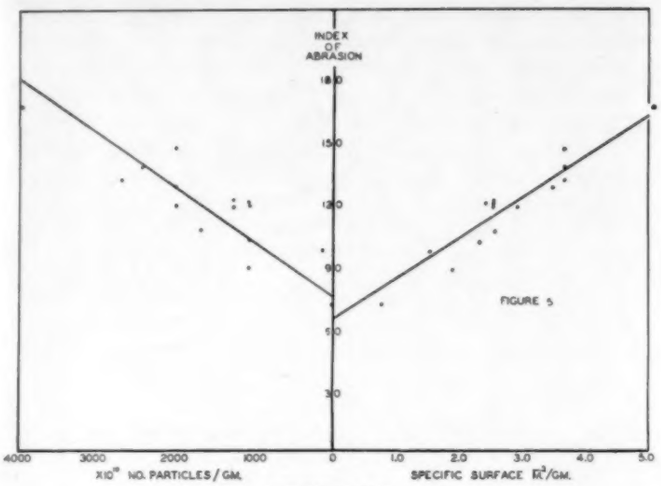


FIGURE 5

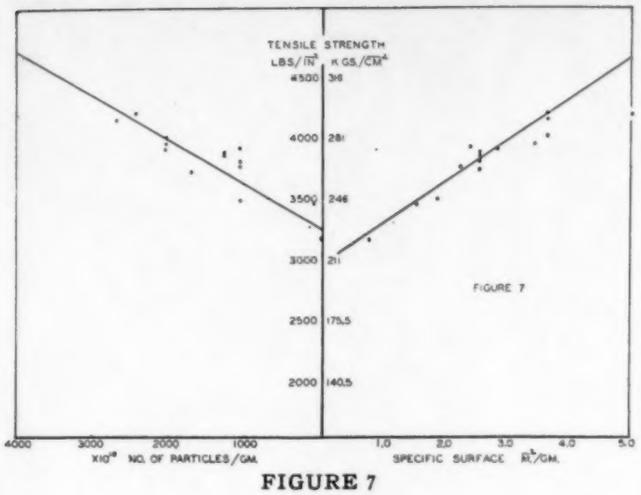


FIGURE 7

Subsequent testing of rubber compounded with various mixtures of these oxides showed that the change was much greater than that indicated by the change in this average, so attention was directed toward the other two averages d_s and D.

From the data in Table 1 it is possible to calculate the specific surface (S) and number of particles per gram (N), and these values are shown below in Table 2.

Table 2

	—d_1—	—d_s—	—D—	*S*	*N*
	Averages in Microns			*m*–^{2}/*gm.*	*Number/gm.*
Sample A	.132	.210	.165	5.08	3975 x 10^{10}
Sample B	.149	.292	.207	3.64	2013 x 10^{10}
Sample C	.343	.707	.502	1.51	141 x 10^{10}
Sample D	.873	1.382	1.100	.77	13 x 10^{10}

These data are plotted on Figure 4, specific surface against number of particles per gram, the points A, B, C, and D representing the samples with those letters. By connecting the points A and B a line showing the relationship between N and S for mixtures of these two oxides is obtained. The simple expedient of measuring the length of this line and calling it 100 per cent and measuring the distance from A to any point on that line will permit the determination of the percentage of each of the two pigments to be used in preparing a sample with any N/S ratio that is desired and which falls on the line. This can also be done between A and C, A and B, B and C, and C and D.

Starting with the point B, it was possible to get two samples: F, by mixing A and C; and E, by mixing A and D, which had the same specific surface as B but a varying number of particles per gram. By the same procedure, we obtained Samples H and G which had the same number of particles per gram but varying specific surface.

Repeating the procedure Samples I, J, K, and L were prepared, all having the same specific surface but varying in the number of particles per gram; and I, N, M, and O of the same number of particles per gram but varying in the specific surface. The percentage of each of the original samples used in the mixtures prepared is shown in Table 3.

Table 3

Sample	*%A*	*%B*	*%C*	*%D*
A	100	.....	.....	.....
B	.....	100	.....	.....
C	.....	.....	100	.....
D	.....	.....	.....	100
E	68	.....	.....	32
F	60	.....	40	.....
G	50.5	.....	.....	49.5
H	49	.....	51	.....
I	.....	50	50	.....
J	.....	64	.....	36
K	30	.....	70	.....
L	42	.....	.....	58
M	.....	53	.....	47
N	25	.....	75	.....
O	27	.....	.....	73

This series of samples was made up by mixing the components through a flour sifter four times before incorporation into the rubber compound. A large master batch of all the ingredients in the

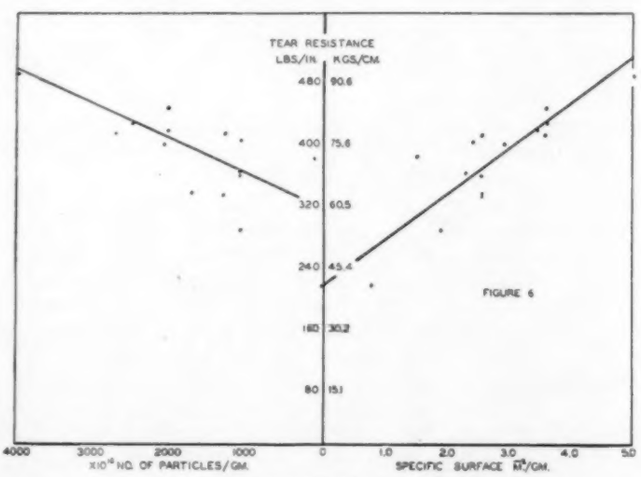


FIGURE 6

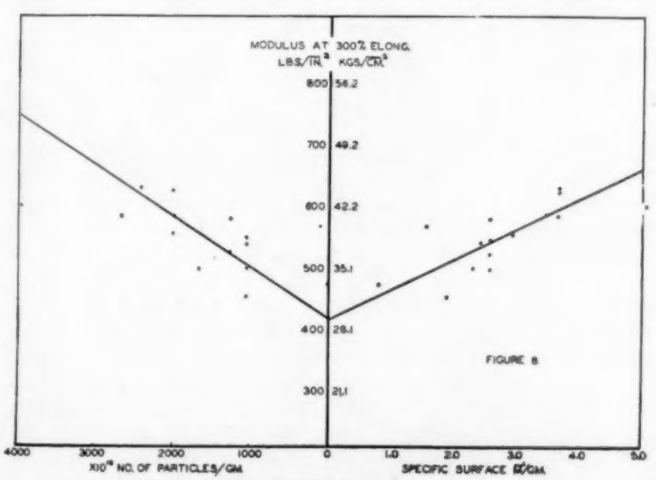


FIGURE 8

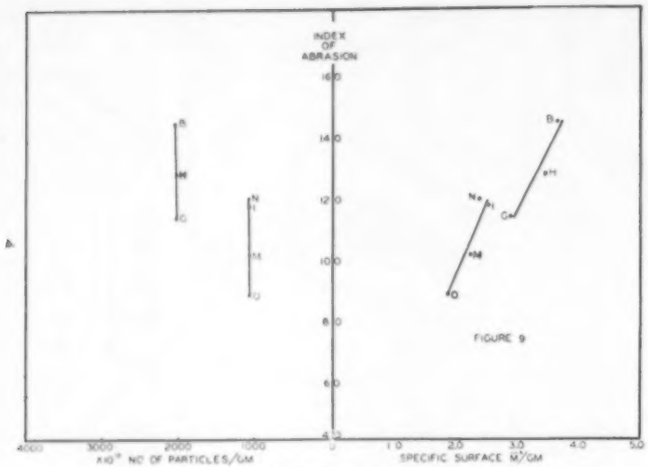


FIGURE 9

formula except the zinc oxide was prepared to eliminate compounding variations.* The pigment was incorporated with careful control of the temperature and time of milling to insure equal breakdown in all cases. The compounds were allowed to age 24 hours before curing and another 24 hours before testing. A number of physical properties were then determined and the results obtained are shown in Table 4.

Discussion

The data shown in Table 4 have been analyzed and this analysis is here presented in two ways. The first, and more general study has been to plot the specific surface and number of particles per gram for all the samples against several physical properties which showed the maximum variation. From Figure 5, the conclusion can be drawn that, in general, as specific surface increases abrasion resistance increases; and likewise, as number of particles per gram increases, the abrasion resistance increases. The relationship looks somewhat better in the case of specific surface.

*This formula was as follows:

Pale Crepe	920
Sulfur	28
Captax	9.2
Stearic Acid	28
Zinc Oxide	1120

Figure 6, shows the tear resistance and Figure 7, the tensile strength and Figure 8, the modulus at 300 per cent elongation. The same general conclusions can again be applied.

A little closer scrutiny of the data, however, shows that further conclusions are warranted. In Figure 9, are shown the abrasion data for those samples having the same number of particles per gram but varying specific surface. A rather marked trend is evident, that abrasion resistance increases as the specific surface increases. On analysis of the tear resistance data, Figure 10 shows the same marked trend toward higher tear resistance with increased surface.

On the other hand, an analysis of the series in which specific

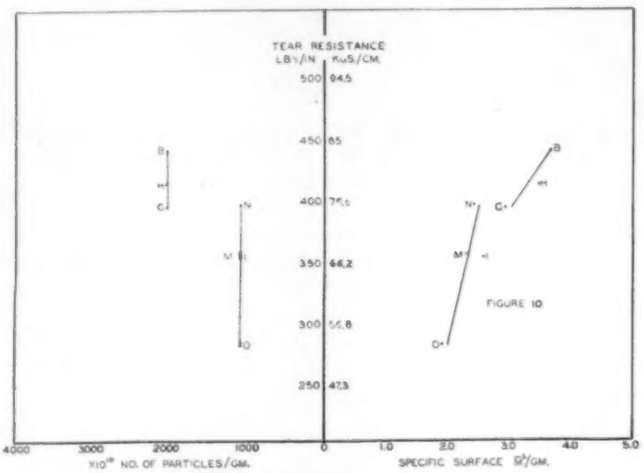


FIGURE 10

surface was kept constant and number of particles per gram was varied, no such definite trend was developed. Figure 11, shows the abrasion data and Figure 12, the tear data for these samples. It is questionable whether any definite relationship exists here, but the indication is tear resistance decreases with an increase in number of particles per gram, a conclusion that is not justified in view of the general conclusion drawn when all the data are considered.

Considering Figure 11, it will be noticed that while the specific surface is constant as evidenced by the vertical lines, the abrasion resistance varies somewhat. This variation is apparently a function

Table 4

	S	*N*	*Abrasion	*Tear Resistance	*Tensile	*Modulus		*P. & J.	*Energy of Resilience*		
						300%	450%	Hardness		Plasticity	
	$m^2/gm.$	x 10^{-10}	Index	Kgs./cm.	Kgs./cm.^{2}	Kgs./cm.^{2}			Kgs. cm./cc.	3' Plast.	% Rec.
A	5.08	3975	163	91	290	42	105	1.17	621	2.04	1.18
B	3.64	2013	144	82	280	43	104	1.13	605	2.03	.74
C	1.51	141	95	70	240	40	100	1.09	440	1.95	.41
D	.77	13	70	39	218	33	79	1.14	418	1.84	.38
B	3.64	2013	144	82	280	43	104	1.13	605	2.03	.74
F	3.64	2440	135	79	292	44	105	1.08	565	2.05	.88
E	3.64	2700	129	77	288	41	102	1.09	588	2.05	.83
B	3.64	2013	144	82	280	43	104	1.13	605	2.03	.74
H	3.44	2013	126	77	274	41	105	1.08	587	2.09	.77
G	2.92	2013	116	74	271	38	98	1.07	568	2.01	.90
I	2.56	1080	117	66	263	38	96	1.09	518	1.87	.59
J	2.56	1260	115	61	269	36	87	1.15	524	2.03	.59
K	2.56	1280	119	77	269	40	94	1.10	535	2.02	.64
L	2.56	1700	105	62	260	35	81	1.11	507	1.98	.76
I	2.56	1080	117	66	263	38	96	1.09	518	1.87	.59
N	2.40	1080	118	74	274	37	91	1.10	526	1.98	.81
M	2.28	1080	100	66	261	35	85	1.13	470	1.99	.60
O	1.88	1080	87	53	242	31	82	1.11	456	1.93	.62

*Average of two independent determinations.

of uniformity for in one series Sample B is the most uniform, F, which is a mixture of A and C, is next and E, which is a mixture of A and D has the poorest uniformity. In the second series, I, which is a mixture of B and C is most uniform and J, K, and L follow in that order. This reasoning is further justified when applied to the other data.

Summary

This paper offers further substantiation of the opinion that the reinforcement of a rubber compound is a function of the specific surface of the pigment and any study of the mechanics of reinforcement should be based on this property.

When measured by the photomicrographic method as described, it was found that the "d_3" average diameter and the specific surface calculated therefrom gave the best correlation with physical properties; that the "D" average diameter and the number of particles per gram calculated therefrom gave a fair correlation; that the "d_1" average diameter gave essentially no correlation.

It was further shown that if the uniformity coefficient is maintained constant in a series of samples, any one of these diameters would have a certain practical significance.

The author acknowledges the assistance of C. H. Hall and N. A. Brown in the preparation of this paper.

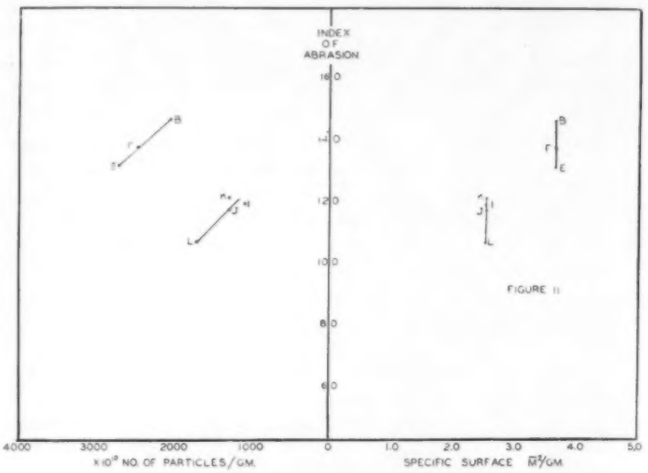


FIGURE 11

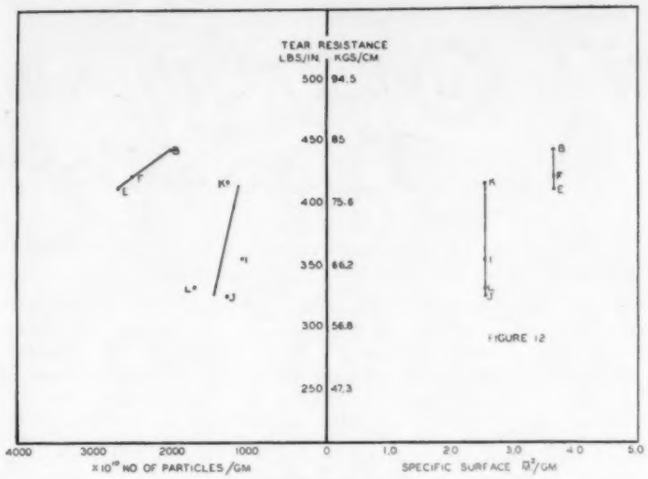


FIGURE 12

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A. S. T. M. Research Activities (1932-33)

A SUMMARY of the research projects of the committees of the American Society for Testing Materials for 1932-1933, touching on rubber subjects, which are either in progress or will be studied during the coming year have been announced by the Society, in the resume of the various committees' activities listed below. Except for several new investigations not as yet reported upon, reference is made in every case to the latest report on each project. Reports now appearing in preprints prepared for the 1932 annual meeting will be published in the 1932 *Proceedings* of the Society, which publication should be referred to when the *Proceedings* become available early in December.

Abrasion Test for Rubber Products (Committee D-11).—Consideration of abrasion tests for application to those rubber products where abrasion in service is the most important element in determining the life of the material, such as conveyor belting, automobile tires, rubber-covered air and water hose, rubber heels, etc. See preprint, 1932 Report of Committee D-11; also Symposium on Abrasion Testing of Rubber Products, *Proceedings*, Vol. 31, Part II, p. 895 (1931).

Life Test for Rubber Products (Committee D-11).—Accelerated aging tests of various types of rubber compound in comparison with natural aging of the same samples. Extensive tests completed, see preprint, 1932 Report of Committee D-11.

Dynamic Fatigue Testing for Rubber Products (Committee D-11).—To study the general field indicated in title and particularly as applied to repeated extension, bending and similar tests. Studying separation tests on plied rubber and fabric materials; also methods of flex testing rubber stock without fabric. See preprint, 1932 Report of Committee D-11.

Shock Absorption of Rubber Products (Committee D-11).—Study, development and standardization of methods of test which are particularly suitable in the evaluation of rubber stocks for shackles, motor supports, bumpers and shock insulators. Studying effect of repeated compression on rubber compounds, also flow properties of rubber and adhesion of rubber to metals. Tentative method of test for hardness of rubber developed. See preprint, 1932 Report of Committee D-11.

The Conservation of Rubber
TRANSMISSION BELTING

By H. J. JUDE

***EDITOR'S NOTE:** The important factor in the life service of of a belt is to achieve minimum cost of operation, coupled with efficiency. H. S. Jude, the MECHANICAL WORLD (London), September 16, 1932, has shown in the following article how deterioration and premature failure can be avoided. The article is reprinted herewith with due acknowledgments to the author and the publication. Mr. Jude demonstrates that the cure for a "belt eating" drive is not necessarily a longer belt, since the lack of flexibility in the particular drive may be the cause of failure. In this case a too strong belt would be subject to excessive internal work.*

THE true cost of any transmission belt can be determined only when, after it has completed its service, it is charged with all the expense it incurs, and credited with the horsepower it transmits. It is obvious that to achieve the minimum operating cost, the life of the belt in service is an important factor, and in many cases a much more favorable ultimate figure would be shown if rubber belts were correctly specified, applied, and maintained.

For several distinct reasons it is advisable to carry a stock of belting in the stockroom. First there is the difficulty of ideal storage to be faced. To keep in good condition for an appreciable length of time, rubber belts need to be stored in a cool dark place, away from steam pipes. They should also be packed so that the weight rests squarely on a flat floor, otherwise they will be pulled out of true by their own weight and run crooked when placed in commission.

Transmission belts usually remain in service for a considerable time, and it is therefore uneconomical to tie up capital in slow-moving stock. There is always a decided risk that when a particular size is out of stock the millwright may substitute the nearest available, irrespective of whether it is suitable or not. It is not generally known that "to err on the safe side" is very often a belting mistake. A thicker belt than the correct one may transmit an appreciably lower horsepower, and when this is the case premature failure in the form of ply separation is almost certain to result. On the other hand, a thinner belt may not be sufficiently strong to deliver the load.

Most mill supply houses carry a representative range of sizes of rubber belting in the leading makes ready for immediate delivery, and even when the proper size is not available in stock, it can be obtained from the manufacturers in a short time.

In some instances, however, it is a wise policy to keep reserve belts in stock for replacements to those drives which when out of action interfere seriously with production.

Cutting to Length

When a new belt is to be applied, the length should be determined by a steel tape drawn tightly round the pulleys. It is most important that both ends of the belt should be cut dead square, clean, and sharp. Even the slightest deviation from the true right angle robs a belt of its ability to deliver the full service. This is because one side is slightly shorter than the other, and the belt has perforce to carry the load on one shoulder. If the cut is appreciably different from the 90° angle the belt will run dog-legged or jump off altogether. The best method of cutting to length—the only dependable one, in fact—is to use a sharp-pointed knife and a steel square.

The ordinary method of throwing a belt over from a fast to a loose pulley is highly detrimental to a rubber belt. The reason is obvious. If a belt is travelling at the rate of 2000 ft. per min., and it takes only half a second to change from one pulley to the other, a simple calculation will show that 16 ft. of belting will be rubbed along the edge. On some drives this rubbing action is incessant throughout the day's work, and consequently the edges are frayed in a comparatively short space of time. The duck which forms the carcass of the belt is then left exposed to the humid atmosphere, and the gradual process of disintegration commences. If a roller a few inches long is cut from a piece of scrap pipe and placed over each arm of the fork, the liability to damage will be overcome, and the belt will then be capable of giving a much greater period of service.

Factors to be Considered

For every drive there is one construction of rubber belting which can be reasonably expected to produce a lower ultimate ratio of cost to service than any other, and the selection of the most economical belt is largely a matter of choosing the proper number of plies for the job. It may be a surprise to many engineers to learn that the cure for a "belt-eating" drive is not necessarily to apply a stronger belt. A weaker one will frequently return a better-looking cost sheet. The vital point is the relation which exists between the three factors: (1) Horse-power requirement; (2) belt speed; (3) diameter of the smaller pulley; and the most important of these is the third. When a belt is run over a small pulley it transmits only a fraction of its rated horsepower capacity, due to the fact that the belt is too stiff to permit sufficient flexibility for it to grip the pulley face throughout the arc of contact. More serious than that even is the damage to the belt. Whenever a rubber belt is flexed the plies endeavor to "spread-eagle" because the outer ones have a greater distance to travel than the inner, and as a consequence there is a strain on the rubber bond which unites them. "Costly" transmission drives are very often the result of either too thick a belt being used, too high a speed, or too much horsepower being transmitted for the capability of the belt. The solution to the problem is first to ascertain whether a thinner belt will transmit the full power, and if not, to employ larger pulleys.

Rubber belts have what is termed a "friction" surface—that is, a thin even rubber film which envelopes the carcass of the belt, and which rises and falls according to the weave of the fabric. Principally this skim coat of rubber is intended to protect the belt from damage by wet, acid fumes, etc., but it also affords an excellent grip on either wood or metal pulleys and therefore renders the use of dressing superfluous. Moreover, dressing is liable to be distinctly detrimental, due to its tendency to gather in lumps on both

the belt and the pulley, thus impeding the contact between the two. It is a much better plan to keep both faces spotlessly clean, and certainly free from all traces of oil and grease.

The friction surface on all rubber belts causes miniature suction cups to be formed when the belt is operating under normal tension, greatly increasing the gripping power.

It can be taken as an axiom that when a rubber belt slips the cause is due either to an overloaded condition or to a pulley which is not large enough to permit the proper arc of contact.

At the same time new belts will occasionally slip until they have been run in to the drive. The cause of this is generally to be found in the size of the smaller pulley, and a good expedient is to apply as thin a dressing as possible of boiled linseed oil.

Rubber belting is not suitable for drives where it is impossible to keep the belt reasonably free from oil; but in other cases, provided the drive is well designed, the proper width and ply count installed, and fair attention given to the belt in operation, there is not the slightest reason why rubber should not handle the work with the utmost efficiency and economy.

Tire Dealers' Stocks

FOR the first time since the Rubber Division of the Department of Commerce began in 1924 the semi-annual survey of tire stocks in dealers' hands, the figures for the October 1, 1932, survey are divided into two classes, covering separately the independent tire dealers and "mass distributors," which include the chain stores and mail order houses.

The average number of automobile casings in independent dealers' hands on October 1, 1932, totaled 71.3 as compared with 60.2 on October 1, 1931, and 66.2 on April 1, 1932. The number of reports received from independent dealers in the present survey, showed a falling off of 4.636 returns from October 1, 1931. The details of the comparative statistics for the two years are as follows:

Dealers' Stocks of Automobile Tires

	October 1, 1931			*October* 1, 1932		
	Number	Dealers Reporting	Average per Dealer	Number	Dealers Reporting	Average per Dealer
Total casings	1,617,366	26,882	60.2	1,586,833	22,246	71.3
High pressure cas-						
High pressure casings	211,824	18,741	11.3	174,346	14,489	12.0
Inner tubes	2,185,505	27,062	80.8	2,077,616	22,517	92.3
Solids, etc.	20,947	1,096	19.1	14,380	712	20.2

The figures covering tires in the hands of "mass distributors" include the stocks reported by the two principal mail order houses and their chains of stores, two supply companies merchandising special brand tires (one through its own stores, and the other through independent dealers and oil stations as well as those controlled by its marketing companies), a third independent chain system, and also stocks reported by two oil companies selling tires through their stations in several states. Each of the above reported their complete stocks, and in addition three tire companies reported the complete inventories of their company-owned stores. The stores operated by four other tire manufacturing companies were circularized, and returns were received from 40 per cent of those stores.

The inventory actually reported as of October 1, 1932, is shown below. There are additional oil company stocks, and the stocks of four of the tire companies included are not complete. The stocks reported in the October 1, 1931, survey are also shown, but they are not strictly comparable.

Mass Distributors' Reported Stocks

	October 1, 1932	*October* 1, 1932
Total Casings	1,987,284	2,032,929
Inner Tubes	1,847,440	2,109,690
Solid and Cushion Tires	3,350	2,285
High Pressure Casings	229,438	197,086

In the report of the survey for April 1, 1932, it was stated that mass distributors' complete stocks were estimated at 1,800,000 casings or 500,000 less than in the survey of October 1, 1931. Assuming that the tire company-owned stores, which did not submit reports, were holding average stocks the same as those which did report their figures, the total mass distributors' stocks of casings are estimated at 2,450,000 on October 1, 1932. This would be an increase of 150,000 over a year previous, and an increase of 650,000 over their April 1, 1932, estimated inventory. There is no basis for estimating stocks held by oil companies, selling through chains, from which reports were not received except as indicated previously. The total stocks of inner tubes held by mass distributors on October 1, 1932, are estimated at 2,475,000.

An idea of the true inventory position of the industry is given in the following statement, which is based on an assumption that there were 70,000 active independent tire dealers at the date of each of the last three surveys, plus estimated total stocks held by mass distributors, plus the inventory of manufacturers (incomplete) as reported by the Rubber Manufacturers' Association, Inc.

Industry Inventory of Automobile Casings

	Oct. 1, 1931 (*Thousands*)	*Apr.* 1, 1932 (*Thousands*)	*Oct.* 1, 1932 (*Thousands*)
Independent Dealers' Stocks	4,214	4,634	4,991
Mass Distributors' Stocks	2,300	1,800	2,450
Manufacturers' Stocks	6,527	7,902	4,873
Total	13,041	14,336	12,314

Axle Design and Tire Wear

FIELD investigation of the causes of excessive tire wear on trailers, made by engineers of the Timken-Detroit Axle Company, has shown that tires on trailers are subject to all the common causes of excessive tire wear that may develop on trucks; but that there is something beyond these common causes of excessive tire wear which is contributing to the irregular tread wear often observed on dual-tired trailers.

Troublesome tire wear conditions were found to be directly traceable to the deflection or bending of the trailer axle under load; the resulting inward tilt of the wheels throwing the weight on the inner edge of a single tire or on the inner tire of a dual mounting. The result is an unnatural wiping of the inside shoulders and leads to a breaking down of the fabric and premature failure. The proper remedy is obviously the reduction of axle deflection to a negligible minimum. The attempt to use a positive camber or upward bend of the axle to compensate for the deflection has not proved successful; neither does it answer the problem caused by high-crowned roads.

Tires are built to run in a perfectly vertical and parallel position when the trailer is loaded. Only under these conditions can the operator expect the greatest mileage from his tires. Hence, the solution to the problem lay in new type of trailer axle design, which was ultimately achieved in the form of tubular construction so designed as to resist stresses from any direction and possessing high strength and rigidity with minimum weight.

EDITORIAL COMMENT

More Evidence of Improvement

SEPTEMBER showed an advance over August all along the line in employment, weekly hours of work, and average weekly earnings, and a slight decline in the cost of living, according to the regular monthly statistical survey of wages and the cost of living in the United States by the National Industrial Conference Board. This advance is significant because of its greater relative gain than any similar advance since the depression began.

The monthly statistical tables of the Conference Board afford, in addition to the three matters of vital interest to industry already mentioned, comparisons as to average hourly earnings. This latter item records a decline between August and September. Moreover, a similar increase in hours and average weekly earnings and a similar decrease in average hourly earnings are recorded for each of the twenty-five labor groups for which figures are given.

The September statistics show that the advance in average hours was greater than the advance in employment. With any increase in business activity such a development was to be expected. Unemployment implies idle machines, and partial employment implies incomplete utilization of machines in operation. Therefore an increase of output would be more economically secured by a fuller utilization of machines in operation than by putting additional machines into use. The first course would increase hours of work, and the second would increase the number of workers.

Among the twenty-five industries for which reports are available there were only six that failed to show an improvement in employment. The list of exceptions unfortunately includes the rubber industry. It also includes automobiles, electrical manufacturing, iron and steel, and two branches of foundries and machine shops, namely, those that produce machines and machine tools and those that produce heavy equipment. Each of these industries, however, registered an increase in the number of hours worked per week.

The hours of work per week record an increase of 2.6 hours. Twenty-three industries participated in the increase, and only two industries, printing of news and magazines and foundries, showed a slight decrease, which in both cases was less than half an hour a week. By reason of this increase of working hours, average weekly earnings increased in face of a decrease in average hourly earnings.

In spite of these changes for the better, average hourly earnings decreased, and this would seem to indicate that the policy of wage cutting so much in evidence in recent months had not yet spent its force. A diminution, often indeed trifling, in average hourly earnings appears in sixteen of the twenty-five industries enumerated. In eight of these industries the reduction amounted to one cent or more per hour.

The index of the purchasing value of the dollar stood in September at 130.5 cents as compared with 100 cents in 1923, or three-tenths of a cent more than in August, thus preserving for the wage-earner whatever comfort he may have derived from the fact that every dollar in his pay envelope goes further than it used to do in meeting the cost of living.

"One of the most reassuring signs that the worst is behind us is the manner in which during the past thirty days gains made previously have been largely retained," declares Henry H. Heimann, executive manager of the National Association of Credit Men, in his monthly review of business.

Continuing his analysis of current favorable factors, Mr. Heimann points out that "in a recovery period business conditions do not continue as a rule to improve steadily. They go forward for a measurable amount of gain, following which there is a yielding of some of the gains and then the upward trend is again resumed.

"During the month of September, after gains had been registered by way of some increase in commodity prices, a decided improvement in the textile field, a brightening of the skies in the oil industry, renewed activity in shoe production, a decline in our bankruptcies and a favorable record in the consumption of electrical energy, with an improved car loadings report, anxious eyes in the business world were awaiting the usual reaction and interested in its extent. A slight reaction for a period of ten days did set in but it proved to be but a normal reaction following gains made. The yielding in this respect was only nominal, thus giving renewed hope that at least we are beginning to reach the end of the detour and that a gradual improvement leading toward normal business is in process of development."

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General Manager.....PETER P. PINTO
Editor.....J. P. BUSHNELL
Circulation Manager.....M. A. KRAMER

Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

NORWALK LIMITS FIELD BUT INCREASES SALES

Norwalk Tire and Rubber Company, Norwalk, Conn., has experienced a distinct improvement in sales and earnings during its fiscal year which closed September 30. Thorough realignment and reorganization of operating and sales policies was carried out recently, enabling Norwalk to operate at near capacity for the greater part of the year. During the greater part of the three months ended with September, a season of marked slackness for the industry, Norwalk's plants operated at three shifts a day.

Operations continued on a profitable basis during the quarter, indications now being that net profits were equal to more than four times the annual dividend requirements on the 10,500 shares of 7 per cent $50 par preferred stock and, after preferred dividends, to around 60 cents a share on the 203,000 shares of common stock. In the year ended September 30, 1931, net profits were $98,508, equal on the present capital set-up to 31 cents a common share, after allowing for preferred dividend requirement. For the nine months ended June 30, last, the company reported net profits of $103,665 or 39 cents a common share.

Prior to the profit showings of the past two years, Norwalk had operated at substantial losses, amounting to $194,460 in 1930 and $415,324 in 1929.

Formerly competing on a national basis with the major tire companies, a policy which necessitated maintenance of a large sales organization and production of varied lines of tires, Norwalk now sells only in New England, which is central to its manufacturing plant in Norwalk, Conn., and has limited production to one brand of first-line tires, priced competitively with the first-line mail order brands.

The company is installing additional equipment to increase production in its newly-established battery department. Manufacture of batteries began a month ago and it has been found necessary to double the department's capacity, according to John W. Whitehead, president. The battery, sold under the name "Norwalk Gold Standard" is built in one quality and housed in a hard rubber case. It will be marketed through dealer channels already set up for Norwalk tires.

Sani-Safe Manufacturing Company, of West Orange, N. J., has purchased a factory building at 60-62 Standish Avenue, West Orange, and will manufacture fabricated rubber mats.

Tire Factory Operations

Goodyear Tire and Rubber Company is reported to be currently producing 28,000 tires daily at the Akron plant. It is operating four days a week on four 6-hour shifts a day.

Seiberling Rubber Company is producing 2,500 tires daily. Plants are running three days a week on three 8-hour shifts a day.

General Tire and Rubber Company's current daily production is 4,800 tires. Plants are operating four days a week on four 6-hour shifts daily.

B. F. Goodrich Company is now producing 18,000 tires a day with plants operating five days a week on three 8-hour shifts a day.

Firestone Tire and Rubber Company's current output amounts to 19,500 tires daily with plants operating four days a week on four 6-hour shifts a day.

Kelly-Springfield Loses Suit

The Kelly-Springeld Tire Company recently lost its appeal to the United States Supreme Court from New York court decisions denying recovery of damages claimed as the licensee of the Overman Cushion Tire Company's patent in a suit brought against the Goodyear Tire and Rubber Company.

The high court refused to review the decision of the New York Circuit Court of Appeals, which dismissed the Kelly-Springfield Company's petition on the ground that it showed no statutory right to damages. The petitioner contended that from January 1, 1924, it held a right of notice and objection sufficient to debar a license of the Overman patent to the Goodyear company.

The Kelly-Springfield Company's license agreement provided for the payment of $100,000 in cash and a percentage royalty to the patent owner in return for a license to make, use and sell the pressed-on type of tire vulcanized to a metal base, and for a pledge that no one should be licensed other than the petitioner and the Overman Cushion Tire Company except under conditions set forth in a supplemental agreement.

New Rubber Company

The United Process Company of Akron, Ohio, recently organized, has acquired the former plant of the Pet Milk Company, at Minerva, O., and will begin production within thirty days of a general line of rubber products. C. W. Siegfried, president, says about $13,000 worth of new machinery and equipment will be installed in the plant. Approximately fifty employes will be on the pay roll when operations are started.

GOODYEAR TIRE TESTING FLEET STARTS SOUTH

Annual trip of the tire testing fleet of the Goodyear Tire and Rubber Company to Arizona started Monday, October 31 and the fleet has arrived in Phoenix for a five months' sojourn, during which the six passenger cars and three trucks will roll up close to a million and a half miles.

The purpose of centering winter activities of the test fleet in Arizona is to insure accurate tire mileage testing through continuous operating in warm weather, heat being a natural enemy of long tire life. New developments in design, manufacturing, compounding and other improvements as well as changes in size and type of tires all require the acid test of continuous driving on hot roads to insure quality production.

Fleet personnel includes twenty-two men, eighteen of whom are drivers, one records man, a tire changer, a truck mechanic and a tire engineer. In addition the twenty-two families of these men bring the personnel of the entire test fleet outfit up to sixty-six persons. The youngsters in this group, some of whom are in high school, attend the school maintained at Litchfield Park, Ariz The wives of these men drove their own personal cars through to Litchfield Park, Arizona, Goodyear cotton plantation and guest ranch, in advance of the fleet.

Last year the total mileage of the whole Goodyear tire testing fleet reached a total of 2,587,708 miles, of which 1,375,907 miles were driven in Arizona during the winter. The fleet will average 144,000 miles per month during its stay in the Southwest, and will consume 630 gallons of gasoline and eleven gallons of oil per day.

Firestone Building at Fair

Plans for the special Firestone Tire and Rubber Company Building at Chicago's 1933 Worlds' Fair—A Century of Progress Exposition—have been completed and construction work will start about November 15, according to an announcement by officials of the company.

The main building will consist of a hall 50 feet wide and 150 feet long, a large exhibition room, two lounge rooms, offices, stockroom and power plant. The large hall will house machines for making tires. Visitors coming through either entrance and following fifteen-foot aisles will be able to watch the process of manufacturing tires. Tires at the rate of one every ten minutes will be manufactured. All the operations of tire making will be demonstrated to the public.

UPWARD SWING REPORTED IN TRUCK TIRE EXPORTS

For the first time in four years, exports of truck and bus tires from the United States and Canada this year were higher in the midyear months of July and August than in the January-February period, according to the Commerce Department figures.

In 1929, the first two months of the year showed exports of 115,897 tires, against 91,482 in the midsummer months. During 1930, the comparative figures were 142,507 and 125,706. Last year they amounted to 99,120 and 82,814, respectively. Figures which have just become available show that the present July and August exports of truck and bus tires were 45,444 units, while the January-February total for the United Sates and Canada was only 43,977.

As over 90 per cent of all Canadian tire manufacturing plants are connected with United States companies, the apparent check in the downward trend of exports is believed to be a very hopeful sign, suggesting a definite turn for the better has finally taken place.

Scrap Rubber Rates Down

After months of endeavor on the part of the Traffic Department of the National Association of Waste Material Dealers, Inc., and the cooperation of several of the rubber companies, it is now competent to announce that carriers have agreed to establish reduced rates on scrap rubber, in carloads, throughout Official Classification territory on basis of 20 per cent of first class, minimum weight 40,000 lbs., effective January 1, 1933. The present basis, except in those few instances where specific commodity rates have been published, are on the sixth class basis which is 27½ per cent of first class.

It has been the general impression of those connected with the industry that a reasonable basis of rates on scrap rubber would have the effect of stimulating the accumulation of rubber at various points throughout Official Classification territory as well as restore to the rail carriers the traffic that has been moving via the motor truck and water lines.

New Connecticut Company

Whitestone Rubber, Inc., is the name of the new Danielson, Conn., corporation which was recently formed to manufacture puncture-proof tire tubes and other rubber goods and mentioned in THE RUBBER AGE, October 25. Incorporation papers, filed October 27, list Bert and James R. Hallock and William J. Mileski as incorporators. Authorized capital consists of 500 shares having no par value. The new concern's plant is located in the village of Elmville, near Danielson, and is known as the "Whitestone mill," from which the corporation's name was taken.

A. S. T. M. Meeting

The 1933 annual meeting of the American Society for Testing Materials is scheduled to be held at the Hotel Stevens, Chicago, Ill., June 26-30, during the Century of Progress Exposition.

Duty on Egyptian Cotton

The Treasury Department is clamping the lid on duty free entry of Egyptian cotton, used in automobile tire construction.

It has become known here that large imports were entered through the ports of New York and Boston as 1 1-16, 1 1-32, and as less than 1⅛, which later were found to be of longer staple.

Apparently not all the cotton could be reached for reclassification, but a sufficient quantity was available to bring about an estimated yield of revenue to the Treasury of approximately $76,000.

One lot of 250 bales came here June 10 and was restapled September 17 and found dutiable at $13,000. Another lot was of 1,200 bales as part of a total importation of something like 3,750 bales, which ranged from 1 3-16 to 1¼, nothing being shorter than the former figures. The duty was fixed at $63,000. These sums were said to have been assessed against automobile tire interests.

Thiokol Products

Thiokol Corporation, Yardville, N. J., announces the perfection of a jacket which, it is claimed, will be a new departure in the manufacture of cables. The announcement was made by the General Cable Company, of New York, which holds a license agreement with the Thiokol firm. The cable will be used for electrical purposes and power lines. The jacket will have all the advantages of rubber and is said to be superior to rubber in resistance to chemical action.

The De Vilbiss Company, of Toledo, O., manufacturer of rubber tubing, paint spray equipment, etc., has been also licensed as users of Thiokol, it is announced by officers of the company.

Lee Tire Report

According to preliminary figures, Lee Rubber and Tire Corporation will show a net profit for the fiscal year ended October 31 of approximately $150,000, officials of the company state. This would be equal to about 50 cents a share on the 300,000 shares of capital stock outstanding. In 1931 fiscal year the company showed a net loss of $625,100. In the first six months of the current fiscal year net loss was $49,476.

Officials state current assets are ten times current liabilities, as against a 4 to 1 ratio a year ago, and that all bank debts, totaling $700,000 has been eliminated. Increased volume and operating economies are responsible for the improved showing, officers of the company state.

Goodrich Sales Up

Sales of Goodrich Silvertown automobile tires for the first six months of 1932 showed an increase of 59.5 per cent over the same period last year, according to the recent announcement of S. B. Robertson, vice-president of the B. F. Goodrich Company. The Goodrich Company also showed an increase of 24.8 per cent in the number of Goodrich tire dealers during the first six months, as compared to the similar period in 1931, Mr. Robertson said.

"DOUGHNUTS" WIN FAVOR IN EUROPE

Despite active competition, the depression and depreciated currencies, American tire manufacturers are meeting with gratifying success in their efforts to push the sale of super-balloon tires in the European market, according to the Department of Commerce. This type of tire, it is pointed out, has made a notable hit with dealers and users generally in that area.

The primary characteristic of such a tire is its ability to perform successfully on bad roads. In foreign countries, especially in those in which the good roads movement has not spread, the advantages of the superballoon tire are obvious.

Furthermore, in Europe and other foreign markets, car ownership is largely confined to the well-to-do classes of the population who are ready and able to pay for innovations which will help to increase their comfort when motoring.

A recent report to the Department of Commerce from its Brussels office revealed the fact that European tire makers have begun making superballoons and are offering increasing competition to United States manufacturers. These European tires are said to be similar to the American product and to have in addition the advantage of being able to be used on existing rims. This particular feature is being widely advertised, emphasis being placed on the fact that the European superballoon tires do not make it necessary for the automobile owner to buy new wheels.

Kelly-Springfield Refinancing

Final papers providing for the capital readjustment plan of the Kelly-Springfield Tire Company, have been filed at Trenton, New Jersey, William H. Lalley, president, announced. This action, Mr. Lalley says, marks the completion of the steps necessary for the change in the capital structure of the company. The new notes and stock, provided for in the plan, are being prepared for distribution to the stockholders.

Canfield Business Increases

Depletion of jobbers' stocks and an early demand for Christmas goods have resulted in a decided improvement in production at the plant of the H. O. Canfield Company, 191 Housatonic avenue, Bridgeport, Conn., which manufactures plumbers' supplies and rubber specialties of all types. An official of the concern told THE RUBBER AGE that business has shown a steady upturn since late summer.

Exposure Testing Station

The opening of a new exposure test station at Miami, Florida, has been announced by the South Florida Test Service, P. O. Box 387, Miami, Fla. The new station is of particular interest to those rubber manufacturers who may desire to have exposure tests made of their products and to those manufacturers and suppliers of rubber chemicals for the testing of their materials for the rubber industry.

Names in the News

F. ROBERT LEE, vice-president of the Thermoid Rubber Company, Trenton, N. J., has been on a lengthy business trip through the west. I. ELY REED, treasurer of the Mercer Rubber Company, Hamilton Square, N. J., recently returned from a business trip in the south. JAMES P. FLYNN, general manager of the Puritan Rubber Company, Trenton, is on a business trip along the Pacific Coast. He will be absent several weeks.

S. W. CAYWOOD, vice-president of the International B. F. Goodrich Company, Goodrich export corporation, has started a journey to the Far East to survey business conditions. Mr. Caywood sailed recently on the liner Empress of Japan, from Vancouver, B. C., and will visit Japan, Hongkong, the Dutch East Indies, India and the Philippines. He will travel more than 20,000 miles before he returns to Akron. He recently returned from a survey of conditions in Pan-American and South American nations.

LESTER W. BROOK, formerly manager of the Akron office of Godfrey L. Cabot, Inc., carbon black manufacturers, has joined the sales force of the C. P. Hall Company, also of Akron, and manufacturers and distributors of chemicals to the rubber industry.

L. P. ARNOLD, vice-president of the Norwalk Tire and Rubber Company, Norwalk, Conn., was the speaker at a luncheon meeting of the Norwalk Rotary Club, October 17, at Founatin Inn, Norwalk. He demonstrated the manufacture of tires with a portable, miniature tire building plant.

FERNLEY H. BANBURY, Ansonia, Conn., has been granted a patent on a rubber working machine, which he has assigned to the Farrel-Birmingham Company, Inc., Ansonia, builders of rubber machinery units.

EDWARD H. BROADWELL, former vice-president of the Fisk Rubber Company, Chicopee Falls, Mass., has been confirmed as permanent receiver of the Westfield Manufacturing Company, Westfield, Mass. Operations of the plant have been profitable under his management as temporary receiver.

EARL H. BARDER, general superintendent of the tire division, the B. F. Goodrich Company, and Mrs. Barder have been on an eastern auto trip, planning to visit Springfield, Mass., Boston, New York, Baltimore and other points.

H. E. COOK, general superintendent of the engineering and miscellaneous departments of the B. F. Goodrich Company, was the speaker at the first conference of the supervisory staff in the engineering and miscellaneous departments of the Goodrich and Miller plants, Tuesday afternoon, October 18. These meetings are held monthly throughout the fall and winter.

Goodyear Factory Changes

Five Goodyear executives figure prominently in changes as to plant management brought about by death of William Stephens, who had been general superintendent. E. J. Thomas has been designated by vice-president Clifton Slusser as successor to Mr. Stephens. He had been assistant factory manager in Slusser's office. H. T. Gillen as new superintendent of Plant 2; L. B. Tompkinson, now in California, as superintendent of Plant 1; W. H. Fleming, assistant superintendent at Akron, to replace Tompkinson in the Los Angeles plant, and R. P. Dinsmore, chief chemist since 1923, as the new head of research and development, are others included in the changes.

E. J. THOMAS

Changes in the organization are to be effected slowly, according to the formal announcement. Mr. Fleming goes to the coast in about a month. Mr. Tompkinson will not arrive in Akron to take over Plant 1 until about January 1.

Mr. Gillen has been with Goodyear since 1900. He started in the shipping department, and through various steps rose to assist Mr. Stephens.

Fleming and Tompkinson, both Akron men, and both proteges of P. W. Litchfield, have served in various executive capacities. Mr. Dinsmore was born in Tewksbury, Massachusetts, and has spent 18 years in Goodyear experimental and chemical departments.

D. C. MADDY, on the technical staff of the B. F. Goodrich Company processing division, was called to Mason City, Ia., by the sudden death of his father, Tuesday, October 11.

J. R. HOOVER, assistant manager of the chemical sales department, the B. F. Goodrich Company, discussed "The Application of the Vulcalock Process of Adhering Rubber to Metal" before the West End Purchasing Agents Association in Cleveland, Tuesday night, October 11.

WALTER SCHNEIDER, B. F. Goodrich Company safety engineer, and HOWARD LOW, Miller Rubber Company, safety engineer, returned to Akron, Monday, October 10, from Washington, where they attended the annual National Safety Congress. They participated in a safety sketch presented before the group.

R. H. WATTLEWORTH, division foreman in the processing division of the B. F. Goodrich Company, lead the discussions at the safety conference of the processing division supervisory staff, Wednesday, October 12.

H. J. BEYNON was recently appointed as assistant superintendent of the Vulcanizing Rubber Company, Morrisville, Pa. Beynon was formerly affiliated with the Dryden Rubber Company, of Chicago, and the Aetna Rubber Company, of Cleveland and Ashtabula, O. The Vulcanized Company is installing equipment in the press department.

COMMANDER J. C. HUNSAKER, vice-president of the Goodyear-Zeppelin Corporation, has been elected president of the newly organized Council of the Aeronautical Sciences, Inc. Commander Hunsaker, a professor of aeronautics at Massachusetts Institute of Techonology, at the beginning of the war returned to the Naval service to direct the design and construction of naval airplanes and airships. He joined Goodyear in 1928 to develop the project of passenger airship lines over the two oceans. He is president of the International Zeppelin Corporation, which plans an airship line to Europe, and vice-president of the Pacific Zeppelin Corporation.

Oenslager Gets Perkins Medal

The Perkins medal for 1933, awarded by the American Chemical Society each year, for the most outstanding work in applied chemistry and regarded as one of the highest honors which can be conferred on an American chemist, has been voted to George Oenslager, the well-known rubber chemist of the B. F. Goodrich Company, Akron, O.

The award is made in recognition of the underlying research which Mr. Oenslager initiated and carried into production in the rubber industry in the development of the carbon black tread and the nitrogenous organic accelerator.

Mr. Oenslager has been connected for many years with the B. F. Goodrich Company and its immediate predecessors, and but for the policies of the company opposing publicity, his work would have long ago been recognized as of great importance and directly responsible for two of the five major achievements which mark the changes that have taken place in rubber technology during the past thirty years. These five achievements can be named as reclaimed rubber, the cord tire, the nitrogenous organic accelerator, the carbon black tread and antioxidants.

Rubber News Around the World

MORE RUBBER PAVING FOR LONDON STREETS

A further interesting development of the movement aiming at the adoption of rubber for road paving is likely to take place in central London very shortly. The various great banking and insurance institutions of Lombard Street have signed and filed a petition to the city corporation asking that when Lombard Street is being repaved it should be done with the Gaisman improved rubber blocks and offering to pay 30s. ($7.50) per square yard towards the total cost of £2 10s. ($12.50) per square yard.

The Streets Committee of the Corporation of London has announced that before it can come to a decision in regard to Lombard Street it wishes those responsible to lay a demonstration area in New Bridge Street (part of which is already paved with rubber), where the traffic is far more severe. This the interests concerned have agreed to do. The corporation is not in a position to give an additional area in New Bridge Street on which to make this new demonstration, being under contract for maintenance of the wood paving for the remainder of the street. It will therefore be necessary to take up 200 square yards from the total area of 700 square yards in New Bridge Street already paved with rubber blocks and replace this 200 square yards by the Gaisman block. When this work is undertaken a sign will be set up stating that it must not be regarded as the repair of a section that has failed, but as the application of a new process which is being tested with a view to its adoption elsewhere in London.

Bata Out of Tire Market

According to recent reports, Bata has given up the idea of manufacturing automobile tires and is offering his tire manufacturing equipment for sale. This of course was decided on by the management after Bata's death. Bata's bicycle tire department will continue to operate and will be expanded during the coming year.

Unconfirmed reports indicate that Michelin has applied to the Government of Czechoslovakia for permission to establish a local branch, capitalized at 20,000,000 crowns (approximately $600,000), for the manufacture and sale of tires.

Goodyear of Canada

Earnings of the Goodyear Tire and Rubber Company of Canada, Ltd., for the first three quarters of the fiscal year were sufficient to cover full year dividends on both preferred and common stocks, after providing usual reserves for depreciation, obsolescence and accrued income taxes, according to C. H. Carlisle, president of the company, in his usual letter to stockholders. Unit sales by the Canadian rubber industry during first three quarters showed decline of 30% from last year's period, and Mr. Carlisle foresees no material improvement during the final quarter.

The company made heavy purchases of raw materials at the low level of the market, and higher prices for cotton and rubber would materially improve its competitive position. Mr. Carlisle predicts better business in Canada in 1933 than in 1932, and finds general conditions throughout the world showing some improvement. He points out, however, that solving of various international economic problems is slow work.

Want an Agent in New Zealand?

American rubber goods manufacturers who might be interested in seeking a sales connection in New Zealand, may write to Joseph Quigley, c/o R. G. Dun and Company, Aukland, New Zealand, who is interested in repreresenting domestic manufacturers of rubber goods. He is prepared to supply bank references and deal on letter of credit terms.

Seiberling of Canada

The Seiberling Rubber Company of Canada, Limited, recently held its annual sales and advertising conference in the Royal York Hotel, Toronto, with C. A. Jones, vice-president and general manager, presiding. Salesmen from all branches heard the progress made by the company during the past year.

F. A. Seiberling, president of the Canadian and American companies, delivered an address in which the stated that the Seiberling company in the United States were operating night and day six days per week and they had difficulty in supplying orders on the better grades of tires. Mr. Seiberling sounded a note of optimism when he noted an upward trend in many commodities in the United States. He also stated that, in his opinion, Canada would be one of the first countries to return to prosperity.

Citroen Makes Rubber Parts

It is rumored in press despatches from London that Citroen, the large French automobile manufacturing concern, is about to start rubber manufacturing. It has obtained from the Chrysler Company the rights of the Chrysler rubber suspension patents and is also going to manufacture all the rubber parts for its cars. The rubber factory will be under the charge of Owen Thompson, late of the Goodrich Rubber Company.

U. K. Footwear Duty Up

Additional duties have been imposed in the United Kingdom, effective from October 21, on rubber footwear, when of non-Empire origin. The present rate of 20 per cent ad valorem is increased by 3d. per pair where the ankle is covered, and by 2d. per pair in other cases. Canadian rubber footwear enters the United Kingdom duty free.

R. G A.. REPORTS BIGGER REDUCTION IN PRODUCTION

Preliminary figures just issued by the Rubber Growers' Association, London, show that so far 363 companies, which produced 11,706 tons of rubber in September, 1931, have returned for September, 1932, an output of 9,621 tons, being a reduction of 17.8 per cent. This is a larger percentage of reduction than was returned for August by the 615 companies covered by the R. G. A.'s complete analysis, the total output for that month being 20,186 tons, against 21,849 tons for August, 1931—a fall of 7.6 per cent. There remain 252 companies to report before complete analysis for September can be made.

Of the decline of 2,085 tons in the output of the 363 companies, compared with a year ago, 1,126 tons is accounted for by 138 companies which have ceased tapping altogether.

Malayan Conditions

Malaya depends upon two industries, tin and rubber, both of which are in terrible condition, rubber the worse of the two. Nevertheless the depression may be all for the best for that country in the long run.

George Davidson, a member of the Rubber Research Institute of Malay, an organization which is supported by the planters to aid them in matters scientific, told THE RUBBER AGE in the Queen's Hotel, Montreal, how he explained the seeming paradox quoted above. The most important work of the Institute consists on bettering the quality and lowering the cost of production of rubber. This is brought about by planting higher grade types of trees, which do both things. These new trees take about eight years to come to maturity and their planting was started nearly four years ago. Thus, in about four years' time, they will be running sap. The present quiet state of the market has enabled the experts to work slowly and surely which would have been impossible had there been big demand from the markets. Also, when the demand brisks up again, the trees will be ready to supply the demand. All in all, the crisis has probably done a great deal of good for the Malayan industry even though it is suffering hardships at the moment.

The Research Institute is supported entirely locally by a levy of ten Malayan cents—(2½ cents)—on every picul, or 133 pounds, of rubber. Estate management on scientific methods has been part of its work and also the increasing of the quantity of rubber produced per acre.

DR. HARRY N. WHITFORD, head of the crude rubber division of the Rubber Manufacturers Association, left New York on November 9, for the Far East, to continue investigations for the Association as to crude rubber production and will particularly study the native rubber output . He will be gone several months.

Pirelli Dies at 84

Senatore Giovanni Battista Pirelli, founder of the great Italian rubber and submarine cable manufacturing firm, died at Milan recently, aged 84. He was born at Lake Como, of humble parents, and only with difficulty was able to complete his studies. The winning of a scholarship enabled him to go abroad and study industrial conditions.

On his return he opened the first Italian rubber manufacturing plant with a small capital and 39 hands. Today the Pirelli firm is one of the largest in Italy, and employs thousands of workers. Its works on the outskirts of Milan are so large that they give the impression of a township, while it has other establishments in Spezia, Villaneuva y Geltru in Spain, Buenos Aires, Southampton, and other places. The truly remarkable development of the firm is due to the activity of its founder, who in recognition of his labors was awarded the distinction of Cavaliere de Lavoro (Knight of Labor). In 1909 he was also made Senatore.

Senatore Pirelli's son, Dr. Alberto Pirelli, in addition to taking an active part in the management of the firm, has represented Italy on economic and financial questions at important international conferences, and on the Young and Dawes Committees. He was formerly a member of the Economic Committee of the League of Nations.

Sues for Tax Refund

B. F. Goodrich Company have sued to enjoin collection of approximately $16,000 to $18,000 in personal property taxes and asked for a court order reducing duplicate valuation on a stock of rubber shoes and boots in warehouses in Akron, O., and on other classified property.

The company also sets up the claim that its million-dollar assembly of tire molds should not be taxed under the law, and that they are valued too high.

The boots and rubber shoes mentioned in the suit are part of a stock that remained when the Goodrich company transferred its rubber shoe factory to Massachusetts and then sold it to the Hood Rubber Company.

The petition claims that the taxable valuation of the property, $1,122,885, based on average monthly value, should be reduced to $816,536 because the tax commission allegedly set up the duplicate on a 70 per cent instead of the legal 50 per cent valuation.

The tire molds, assessed at $1,114,430, the petition maintains, are appraised in excess of taxable value.

Chemical Show Postponed

The Fourteenth Exposition of Chemical Industries is now definitely scheduled for the week of December 4th, 1933, according to a recent announcement by Charles F. Roth, manager.

Thoughtful consideration, of the dates previously scheduled for the exposition, by a number of exhibitors and by the management, has resulted in a decision to postpone it to the week of December 4th, 1933. The selection of these dates will bring the exposition at a time coincident with the annual meetings of the American Society of Mechanical Engineers and of the American Society of Refrigerating Engineers.

"Hurrah for the Depression"

"Hurrah for the Depression" was the subject of an address by Paul N. Swaffield, advertising director of the Hood Rubber Products Company and B. F. Goodrich Rubber Company, Watertown, Mass., at the 13th annual New England district convention of the Advertising Federation of America, held October 17 and 18 at the Hotel Kimball, Springeld, Mass. The slump, he said, has forced manufacturers to reduce production costs, taught retailers that to remain in business they must make profits, and shown the consumer how to spend money wisely. Advertising, the speaker declared, must restore the confidence of the public in nationally-advertised goods.

Minor Rubber Products Company, of 972 Broad Street, Newark, N. J., has been incorporated at Trenton, N. J., with $25,000 capital to manufacture various kinds of rubber goods. T. Tracy Horton and Charles W. Humphreys, both of Maplewood, are the incorporators.

Acquires Rubber Patent

Manufacturing and sales rights on the Watson Rubber Stem Tube Company, Little Rock, Ark., are reported to have been acquired by the United States Rubber Company, which will shortly begin production and distribution.

Smaller Rubber Shipments

Gross exports of rubber from British Malaya during October, totaled 37,946 tons, according to advices received by the Rubber Exchange of New York, Inc. This compares with 41,973 tons exported in September, and 45,911 tons during October, 1931.

For the ten months ended with October, Malayan rubber shipments amounted to 398,061 tons, as against 435,987 tons during the corresponding time last year.

Rubber Stock Quotations

	Last Price		—1932—	
	Nov. 1	Oct. 4	High	Low
Aetna	2	3	3	1½
American Hard Rubber	—	7	—	—
Faultless	22	25	25	12
Firestone	12	13	18½	10¾
do. 6% pfd.	55½	58	59½	45½
Fisk	⅝	¼	¾	⅛
do. 1st pfd.	—	½	2⅜	¼
General	29	35	45	25
do. pfd.	40	—	—	—
Goodrich	5⅛	7	12⅜	2¼
do. pfd.	—	23½	33	7
Goodyear	14⅛	19⅞	29¾	5½
do. 1st pfd.	40	22	69½	19¾
India	—	7½	7	½
Kelly Springfield	1¼	1⅝	2⅞	½
8% certfs. pfd.	1	30½	30	16
Lee	5	6¼	7⅞	2
Mohawk	2½	3	4	1
do. pfd.	20	16	—	—
Norwalk	—	—	2½	¾
Pirelli	—	—	31¾	21
Raybestos-Manhattan	7½	9	12¾	4⅞
Seiberling	2½	3	4½	1
do. pfd.	21	16	22	7
Thermoid	1¾	¾	4	⅞
U. S. Rubber	4⅝	7	10¼	1¼
do. pfd.	8	12½	20¾	3¾

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, NOVEMBER 4, 1932

Crude Rubber

PRICES in the crude rubber market dropped slightly during the fortnight but remained more or less constant around 3⅛ cents. September consumption was particularly disappointing to the trade, in the face of what looked like encouraging signs for an upturn in the industry. Stocks continue to increase and in view of the present statistical position of crude rubber there can be little hope of any advances in price levels for some time. Buying interest is slight and factory activities have slowed down pending the outcome of the elections. London and Liverpool stocks show a decided decline from the same time last year and European consumption appears to be holding its gains.

Prices as of November 3, as reported in the New York outside market, were as follows:

Plantations—

Ribbed Smoked Sheets—			
Spot-Nov.	—	@	.03 7/16
Dec.	—	@	.03 7/16
Jan.-Mar.	—	@	.03 9/16
First Latex, crepe spot	—	@	.03 15/16
Amber Crepe, No. 2	—	@	.03 3/16
Amber Crepe, No. 3	—	@	.03⅛
Amber Crepe, No. 4	—	@	.03
Brown Crepe, Clean thin	—	@	.03 1/16
Brwon Crepe, rolled	—	@	.02 13/16

Latex—

Liquid Latex, per gal.	.70	@	.75

Paras—

Up-river, fine	.07	@	.07½
Up-river, coarse	Nominal		
Acre, Bolivian, fine	.07½	@	.07¾
Caucho Ball, Upper	—	@	.03

Centrals—

Central scrap	.04	@	—
Esmeraldas	.04	@	—

Balata—

Block, Ciudad	—	@	.18

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Nov.	2 7/16	@	2 15/32d
Dec.	2 15/32	@	2½d
Jan.-Mar.	2 17/32	@	2 9/16d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

Spot	——	@	2d

Reclaimed Rubber

There has been no change in prices reported for standard grades of reclaimed rubber over the past fortnight. An encouraging demand has been noted for reclaimed in the industry and production jumped up slightly during September. The percentage of reclaimed consumed to crude during the same month stood at 23.2, the highest since March. Late prices follow:

High Tensile

High Tensile Red	lb.	.04¾	@	.05
Super-Reclaim Black	lb.	.05	@	.05¼

Shoe

Washed	lb.	.05½	@	.05¾

Tube

No. 1 (Floating)	lb.	—	@	.06½
No. 2 (Compounded)	lb.	.04½	@	.04⅝

Tires

Black	lb.	.03¾	@	.04
Black, selected tires	lb.	.04	@	.04¼
Dark Gray		.05	@	.05¼
Light Gray	lb.	.05½	@	.06
White	lb.	.05½	@	.05¾
Truck, Heavy Gravity	lb.	.05	@	.05¼
Truck, Light Gravity	lb.	.05¼	@	.05½

Miscellaneous

Mechanical blends	lb.	.03	@	.03½

Scrap Rubber

Scrap rubber prices advanced slightly in the face of an increase in export demand and additional encouragement from reclaimers. The new prices are hoped also to stimulate accumulations and make collections more attractive. Latest quotations are reported as follows:

(Prices to Consumer)

Auto tire peelings	ton	15.00	@	17.00
Mixed auto	ton	6.50	@	7.50
Clean solid truck tires	ton	24.00	@	27.50
Boots and shoes	ton	13.50	@	15.00
Arctics, untrimmed	ton	10.00	@	12.50
Inner tubes, No. 1	lb.	.02	@	.02½
Inner tubes, No. 2, compounded	lb.	.01¼	@	.01⅝
Inner Tubes, Red	lb.	.01⅜	@	.01½
Air Brake Hose	ton	8.00	@	8.50
Rubber Hose	ton	6.00	@	8.00

Cotton

THE uncertainty surrounding the cotton market has caused another drop in price levels. Mills still report a fair amount of activity but buying interest is slow, pending the outcome of the elections and because of persistent rumors of still lower prices. The export trade, however, continues to give slight encouragement. The last Government crop report of 11,425,000 bales was an advance over the previous report and helped to depress the market.

High, low and closing prices on the New York Cotton Exchange, as of November 3, were as follows:

	High	Low	Nov. 3 Close	Oct. 18 Close
Nov.	——	——	5.92	——
Dec.	6.04	5.99	6.00	6.26
Jan.	6.10	6.04	6.04	6.33

Tire Fabrics

Prices have remained at the prevailing low levels during the past fortnight, with demand light and of the hand-to-mouth variety. Mills report continued moderate production, however. Statistics show that only 98,398,703 yards of tire fabrics were consumed in the first 8 months of this year as against 116,004,763 yards in the same period of last year. Late prices follow:

(Prices Net at the Mill)

CORD				
Peeler, carded, 23/4/3	lb.	.22	@	.22½
Peeler, carded, 23/5/3	lb.	.21	@	.21¼
Peeler, carded, 13/3/3	lb.	.18	@	.18¼
Peeler, carded, 15/3/3	lb.	.19	@	.19¼
Egyptian, carded, 23/5/3	lb.	.34½	@	.35
Egyptian, combed, 23/5/3	lb.	.39½	@	.40
CHAFERS				
Carded, American, 8 oz.	lb.	.18	@	.18½
Carded, American, 10 oz.	lb.	.18	@	.18½
Carded, American, 12 oz.	lb.	.18	@	.18½
Carded, American, 14 oz.	lb.	.17⅛	@	.18
LENO BREAKER				
Carded, American, 8¼ oz.	lb.	.18	@	.21
Carded, American, 10¼ oz.	lb.	.18	@	.21
SQUARE WOVEN				
Carded, American, 17¼ oz. 23-11 ply	lb.	.21	@	.21¼
Carded, American, 17¼ oz. 10-5 ply	lb.	.17	@	.17½

Sheetings

Prices in sheeting constructions used in the rubber industry dropped slightly during the last two weeks in general sympathy with the decline in raw cotton. The market remains inactive. Late prices follow:

40 inch, 2.50 yard	yd.	—	@	.05¾
40 inch, 2.85 yard	yd.	—	@	.05¼
40 inch, 3.15 yard	yd.	—	@	.05⅝
40 inch, 3.60 yard	yd.	—	@	.04¾
40 inch 3.75 yard	yd.	—	@	.04
40 inch, 4.25 yard	yd.	.03⅝	@	.03¾

Ducks

Price levels for duck constructions have remained unchanged during the last two weeks and the market was reported as extremely dull. Current prices are as follows:

Enameling	lb.	.20	@	.22
Belting and Hose	lb.	.22	@	.23
Single filling	lb.	.08	@	.08½
Double filling	lb.	—	@	.10

Closing Prices on Rubber Exchange of New York, Inc.

No 1 Standard Contract of 10 Tons*

FROM OCTOBER 19 TO NOVEMBER 3, 1932

Date	Spot	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Sales
Oct. 19	3.42	3.32	3.36	3.40	3.47	3.53	3.60	3.64	24
20	3.41	3.30	3.34	3.38	3.45	3.52	3.59	3.63	84
21	3.41	3.30	3.34	3.38	3.45	3.52	3.59	3.63	26
22	3.39	3.29	3.32	**3.36**	3.43	3.49	3.55	3.58	5
24	3.41	3.32	3.35	3.39	3.45	3.51	3.57	3.60	10
25	3.46	3.36	3.39	3.43	3.49	3.54	3.60	3.63	78
26	3.41	3.32	3.35	3.38	3.44	3.49	3.55	3.58	48
27	3.50	3.41	3.44	3.47	3.53	3.59	3.65	3.69	38
28	3.60	——	3.55	3.58	3.64	3.69	3.75	3.78	43
29	3.59	——	**3.53**	**3.56**	3.62	3.68	**3.74**	3.77	90
31	3.50	——	3.43	3.46	3.53	3.59	3.66	3.71	91
Nov. 1	3.35	——	3.30	3.33	3.39	3.44	3.50	3.53	29
2	3.33	——	3.28	**3.31**	3.37	3.42	3.48	3.51	78
3	**3.33**	——	**3.28**	**3.31**	3.37	3.42	**3.48**	3.50	99

*This contract will be superseded by "No. 1 B Standard" on April 1, 1933

CHEMICALS

THERE has been no price changes reported in the general list of rubber chemicals during the past fortnight and the demand has remained low in line with the restricted production schedules of the rubber goods manufacturers. More experimentations are being made in the application of rubber chemicals direct to latex, and a whole new field in rubber technology and chemistry is opening up in this direction. Latest quotations for the standard grades of rubber chemicals and compounding materials follow:

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.43
Diphenylguanidine	lb.	.33 @	.34
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.42
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.46 @	.47
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.25 @	.27
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.05¾@	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	5.65 @	5.75

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.36 @	.37
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.04 @	.08
Umber, Turkey	lb.	.04 @	.06
Greens			
Chrome, light	lb.	.23 @	.26
medium	lb.	.26 @	.28
dark	lb.	.28 @	.33
Chromium Oxide, bbl.	lb.	.23 @	.27
Reds			
Antimony			
crimson, 15/7	lb.	.40 @	—
sulfur, free	lb.	.52 @	.56
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Whites			
Lithopone, Albalith	lb.	.04½@	.04¾
Lithopone, Azolith	lb.	.04½@	.04¾
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾@	.06
ZZ (leaded)	lb.	.05½@	.05¾
Horsehead Lead Free Brand:			
Selected	lb.	.05¾@	.06
Special	lb.	.05¾@	.06
XX Red	lb.	.05¾@	.06
XX	lb.	.05¾@	.06
XX Green	lb.	.05¾@	.06
Leaded Brand, Standard	lb.	.05½@	.05¾
Sterling	lb.	.05½@	.05¾
Superior	lb.	.05½@	.05¾
Lehigh	lb.	.05¼@	.05½
U. S. P., bbls.	lb.	— @	.12¾
Kadox, black label	lb.	.09⅝@	.09⅞
Blue label	lb.	.08⅝@	.08⅞
Red label	lb.	.07¼@	.07½
Cryptone, No. 19	lb.	.06½@	.06¾
Cryptone CB, No. 21	lb.	.06½@	.06¾
XX Zinc Sulphide, bbls.	lb.	— @	.13
St. Joe, black label	lb.	.05¾@	.06
green label	lb.	.05¾@	.06
red label	lb.	.05¾@	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾@	.06
Anaconda, selected lead free	lb.	.06¼@	.06½
Florence White seal, bbls.	lb.	— @	.10⅞
Green seal	lb.	.09⅝@	.09⅞
Red seal	lb.	.08⅝@	.08⅞
Yellows			
Chrome	lb.	.16 @	.16½
Ocher, dom. med.	lb.	.01½@	.02

BLACKS

Arrow "Aerfloted"			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
Arrow "Aerfloted" Specification, c.l. f.o.b. wks., bags	lb.	.03 @	—
Bone, powdered	lb.	.05½@	.12½
Carbon, compressed	lb.	.02¾@	.07
uncompressed	lb.	.02¾@	.07
"Certified," Cabot			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Disperso" f.o.b. La.	lb.	.028 @	.071
f.o.b. Texas	lb.	.02¾@	.07
Drop, bbls.	lb.	.05½@	.14
"Excello," compressed	lb.	.03 @	—
"Fumonex"	lb.	.02½@	.06
"Gastex"	lb.	.02½@	.06
Lampblack	lb.	.06 @	.08
"Micronex"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Supreme"	lb.	.02¾@	—
Thermatomic—"P 33"	lb.	—	—
"Thermax"	lb.	—	—
United, "Dixie" and "Kosmos"			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Velvetex"	lb.	.02 @	.05

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	13.40 @	14.00
Barium carbonate (98-100%)	lb.	.05 @	—
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	33.00 @	—
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	60.00 @	75.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	70.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	6.00 @	7.00
Aerfloted, Suprex	ton	6.50 @	8.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Par	ton		
Tensulite		15.00 @	—
Cotton Flock	lb.	.08 @	.16
Glues, extra white	lb.	.15 @	.22
medium white	lb.	.12 @	.14
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesia, carbonate	lb.	.05¾@	.06
Mica	lb.	.04 @	—
Rottonstone (powdered)	ton	23.50 @	28.00
Soapstone, powdered	ton	16.00 @	18.00
Starch, powdered	cwt.	2.34 @	—
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.10
English cliffstone	cwt.	1.50 @	1.70
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.10½@	—
Zinc Stearate	lb.	.20½@	—

MINERAL RUBBER

Genasco (factory	ton	40.00 @	42.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	23.00 @	28.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hy iro-Carbon	ton	27.05 @	29.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.26½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08 @	.12
Stearic, double pressed	lb.	.08 @	.12
Alkalies			
Caustic soda, 76%	cwt.	2.50 @	2.90
Soda Ash, 58% C.L.	cwt.	1.15 @	1.17½
Oils			
Corn, refined, bbls.	lb.	.05½@	.06
Cottonseed, crude		.03½@	.04
Degras (c.l. 100 bbls.)	lb.	.02¾@	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¼@	—
Fluxrite	lb.	.05½@	.06
Palm Lagos	lb.	.03¼@	.03½
Niger	lb.	.02¾@	.03
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.59 @	.61
destructively distilled	gal.	.58 @	.62
Witco Palm Oil	lb.	.07½@	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt. bbl.		7.00 @	—
Rosin, grade K, 280 lb. bbl.		4.35 @	—
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	10.00 @	11.00
Solvents			
Acetone, pure	lb.	.10 @	.13
Alcohol, denatured,			
No. 1 bbls.	gal.	.37 @	.45
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulfide	lb.	.05½@	.06¾
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.28
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.45½@	—
wood	gal.	— @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.30 @	.32
Carnauba	lb.	.25 @	.26
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.05 @	.06
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02 @	—
White crude scale 124/126	lb.	.02 @	—
Refined, 125/127	lb.	.02¾@	—
Refined, 128/130	lb.	.03¼@	—
Refined, 135/137	lb.	.04 @	—
Refined, 138/140	lb.	.06¾@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

SPECIALTIES

Aromatics- Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.06 @	.08
White	lb.	.08 @	.12
Brown	lb.	.07 @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.04 @	—
Sulfur flour,			
Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

VERY little change can be noted in the statistical situation affecting the rubber industry as a whole from a domestic standpoint. The disappointing consumption figure for September was only mildly compensated by the drop in imports, but arrivals still continue to exceed demand, with the consequent rise in stocks, which now total over 410,000 tons, or much exceeding a year's supply. On the basis of the commodity's statistical position it could not be expected that the price levels on the Exchange and open market would show no improvement and, in fact, they registered a slight decline during the month.

Tire production and shipments in August declined and inventories showed a corresponding increase. The tire dealers' stocks survey, conducted by the Department of Commerce, semi-annually, showed an advance in the average number of automobile casings left on hand in stock of the independent dealers and a large inventory in the hands of chain stores and mail order houses.

A bright spot in the statistics is found in the reclaimed rubber figures, which not only showed a decided increase in production and a decline in stocks, but an extremely favorable advance in the consumption of reclaimed, the percentage of reclaim consumed during September to the amount of crude rubber totaling 23.2, the highest average since March of this year.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,574,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,133	72,918,949	6.54	25,595	4,255,572	7.42	471,543
1931:							
Jan.	36,307	7,190,591	8.84	1,706	350,480	9.17	34,601
Feb.	34,005	6,564,969	8.62	1,799	357,078	8.86	32,206
Mar.	40,393	7,356,505	8.18	2,800	534,180	8.52	37,593
Apr.	44,536	7,712,941	7.73	2,607	528,947	9.06	41,929
May	35,526	5,886,633	7.40	2,501	418,301	7.47	33,025
June	46,233	6,918,900	6.68	2,749	440,604	7.15	43,484
July	43,469	6,023,743	6.19	1,435	223,587	6.96	42,034
Aug.	38,669	5,138,404	5.93	2,324	345,953	6.65	36,345
Sept.	38,494	4,970,324	5.76	1,362	187,481	6.14	37,132
Oct.	41,131	4,803,582	5.21	1,527	203,574	5.95	39,604
Nov.	43,345	4,742,218	4.72	1,403	198,284	6.31	43,435
Dec.	53,536	5,610,129	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.80	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
September	28,956	1,774,403	2.73	2,388	241,960	4.54	26,568
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1925	1926	1927	1928	1929	1930	1931	1932
Jan.	29,638	32,196	31,518	34,403	43,002	36,194	28,557	27,962
Feb.	29,761	31,136	30,137	33,702	41,594	33,302	28,797	30,011
Mar.	33,498	32,936	36,141	35,688	44,730	35,540	32,788	27,828
Apr.	34,139	32,696	35,871	32,772	47,521	39,686	33,321	25,953
May	35,322	29,364	34,592	37,333	49,233	39,386	37,817	29,197
June	35,822	28,593	33,801	37,676	43,227	34,195	37,916	39,116
July	36,053	27,577	29,219	37,407	41,526	29,508	31,937	28,272
Aug.	35,909	34,533	33,460	42,927	38,274	30,850	27,586	22,372
Sept.	31,691	32,904	27,214	39,882	34,707	25,515	23,638	22,491
Oct.	29,047	29,936	26,790	40,857	34,800	27,516	22,277	—
Nov.	28,253	28,080	26,792	37,461	27,659	23,691	22,943	—
Dec.	28,748	26,293	25,492	31,232	28,531	21,687	21,409	—
Totals	388,481	366,149	371,027	441,340	469,804	375,980	348,986	—

Figures on Quarterly Basis

Quarter	1925	1926	1927	1928	1929	1930	1931	1932
Jan./Mar.	95,263	94,301	99,216	103,558	128,565	101,610	89,652	85,309
Apr./June	104,099	87,109	103,242	103,500	139,292	112,229	107,755	92,643
July/Sept.	99,493	93,793	89,210	117,573	113,746	85,261	83,632	—
Oct./Dec.	85,789	83,212	80,860	117,597	84,872	72,020	65,645	—
Totals	384,644	358,415	372,528	442,227	466,475	371,120	346,684	—

Note—The Rubber Association estimates its monthly rubber consumption figues to be 80 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1930	1931	1932		1930	1931	1932
January	25,731	26,844	26,845	July	38,256	39,459	31,317
February	26,509	26,133	25,344	August	37,433	39,459	35,207
March	31,029	31,037	29,451	September	37,823	36,670	33,645
April	34,549	33,400	30,252	October	32,267	35,051	—
May	36,497	35,716	31,574	November	30,984	30,640	—
June	35,902	38,375	38,766	December	29,094	30,529	—

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

1930	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
January	—	15⅞	15⅝	15⅝	—	15⅝	15⅝	15	14⅞	14⅝	14⅝	—	—	14⅝	14⅝	14⅝	14⅝	15⅛	—	14⅝	14⅞	14⅞	15¼	15¼	15¼	15⅝	15⅝	15⅝	15¼	15¼	15¼	15¼
February	—	15¼	15	15¼	—	15⅝	15½	15½	—	15⅝	16	15	15⅝	15⅞	15⅞	15⅝	16⅛	15⅝	16½	16⅛	16½	—	—	—	16	16	—	15⅝	15⅝	15⅝	15⅝	15⅝
March	15⅝	15⅝	15⅝	15⅝	15¼	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15½	15¼	15⅝	16½	—	—	15⅝	15⅝	15⅝	15⅝	15⅝	—	16⅝	15⅝
April	15½	15½	15¼	15¼	15¼	14¾	14¾	14¾	15⅛	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	15	15	15	15	15	15	14⅞	14⅝	14⅝	14⅝	14⅝	14⅝	14¼	—	—	15
May	14⅝	14⅝	14½	14¼	14¼	14¼	14¼	14¾	14⅝	14⅝	—	14⅝	14½	14⅝	14⅝	14⅝	14⅝	—	13⅞	13⅞	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14	14	—	—	14⅛
June	—	—	13⅝	13⅝	13	—	13⅝	—	13⅝	—	12¾	12¾	12¾	12¾	12¾	12	12¼	12	—	11⅝	12	12	12	12	12¼	12¼	12⅝	12⅝	12⅝	12⅝	12⅝	12½
July	12¼	12¼	12	—	10½	—	11⅜	11⅝	11⅝	11⅝	—	11¾	11⅝	11⅝	11⅝	11¾	11⅝	10⅝	10⅝	—	10⅝	11⅜	10⅞	10⅞	10⅞	10⅞	10⅞	10⅝	10⅝	10⅝	10½	11⅛
August	10⅝	10⅝	—	10½	—	10½	10¼	10¼	10¾	11⅝	—	9¾	9¾	10	9⅞	9⅞	9⅞	9⅝	9½	9¾	9⅞	9¾	9¾	9¾	9¾	9¾	9⅝	9⅝	9⅝	—	—	10
September	—	9⅝	9⅝	9⅝	—	9¼	—	8½	8¾	—	8⅝	8¾	8¾	8¾	—	8⅝	8⅝	8⅝	8	8⅝	8⅝	8	8	8	8	8	8	7⅞	7⅞	7½	8⅝	8⅛
October	7½	7½	8¼	8¼	—	8	8	8	8	7⅞	8	8	8	7⅞	8	8	7⅞	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
November	8¼	8¼	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½
December	9½	9½	9½	9¼	9¼	9¼	9¼	9¼	9½	9½	9½	9¾	9¾	9¾	9¾	9¾	9¾	9	9⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8½	8½	8⅝	8⅝	9
1931																																
January	—	8⅝	8⅝	8⅝	8½	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8⅝
February	—	7¾	7⅞	8¼	8¼	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞
March	—	8	8	8	8	8	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼
April	6⅝	6⅝	—	—	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜
May	6	6	—	—	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼
June	6⅜	6⅜	6⅜	6⅜	—	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜
July	6¼	6¼	6¼	6¼	6¼	—	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼
August	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	—	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝
September	5¼	5¼	5¼	5¼	4¾	4¾	4¾	—	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4⅞	4⅞	4⅞	4⅝	4⅝	4⅞
October	—	4½	4½	4½	—	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½
November	4½	4½	—	4⅜	4⅜	—	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
December	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
1932																																
January	—	—	—	4½	4½	4½	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4⅛
February	—	4%	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4
March	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
April	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
June	2⅝	2⅝	2⅝	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
July	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼
August	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼
September	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
October	—	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1925

Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45
1912	121.60	1916	72.50	1920	36.30	1924	26.20
1913	82.04	1917	72.23	1921	16.36	1925	72.46

Average Monthly Price per Pound Since 1926

Month	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents
Jan.	79.50	38.75	40.25	20.14	15.24	8.34	4.38
Feb.	62.25	38.25	32.75	23.97	15.85	7.70	4.03
Mar.	59.00	41.04	26.82	24.55	15.34	7.71	3.35
Apr.	51.25	40.86	18.97	21.18	14.93	6.43	3.02
May	47.75	40.76	18.99	21.46	14.24	6.49	3.09
June	42.50	37.25	19.59	20.64	12.45	6.35	2.66
July	41.03	34.87	19.40	21.30	11.24	6.37	2.89
Aug.	48.50	35.12	19.46	20.59	9.96	5.38	3.63
Sept.	41.00	33.67	18.47	20.37	8.28	5.08	3.84
Oct.	42.50	34.32	18.83	19.67	8.20	4.87	3.65
Nov.	38.50	37.58	18.26	16.62	9.01	4.65	—
Dec.	38.25	40.63	17.97	16.12	9.05	4.64	—
Average for Year	48.50	37.72	22.48	20.55	11.98	6.17	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	July	Aug.	Sept.	Oct.	Day	July	Aug.	Sept.	Oct.
1	1 11/16	—	2⅞	2⅝	17	—	2 7/16	2 17/32	2 5/16
2	1 11/16	2⅛	2 27/32	—	18	1⅞	2⅝	—	2 11/32
3	—	2 3/16	3 1/32	2½	19	1⅞	2 7/16	2 7/16	2⅜
4	1¾	2¼	—	2½	20	1⅞	2 7/16	2⅝	2 7/16
5	1¾	2¼	3 1/16	2 15/32	21	1⅞	—	2 9/16	2 7/16
6	1 13/16	2 5/32	3 11/32	2 5/32	22	1⅞	2 13/32	2 11/16	2 7/16
7	1 13/16	—	3	2 15/32	23	1⅞	2 15/32	2 21/32	—
8	1 13/16	2 9/32	2 15/16	2 15/32	24	1⅞	2½	2 23/32	2 7/16
9	1 13/16	2¼	2⅞	—	25	—	2 11/16	—	2½
10	—	2 5/16	2¾	2 7/16	26	1 5/16	2 21/32	2¾	2½
11	1⅞	2 7/16	—	2 13/32	27	1 1/16	2 21/32	2 19/32	2½
12	1⅞	2⅝	2 11/16	2 7/16	28	2 1/16	—	2 21/32	2 17/32
13	1⅞	2⅝	2 19/32	2 13/32	29	2 1/16	3 1/32	2 19/32	2 9/16
14	1⅞	—	2 23/32	2 13/32	30	2 1/16	3 1/32	2⅝	—
15	1⅞	2 7/16	2 17/32	2 13/32	31	—	2 29/32	—	2½
16	1⅞	2½	2 19/32	—					

Average Monthly Price Per Pound

Month	1929 Pence	1930 Pence	1931 Pence	1932 Pence	Month	1929 Pence	1930 Pence	1931 Pence	1932 Pence
Jan.	9.942	7.471	4.160	3.052	Aug.	10.505	4.880	2.385	2.654
Feb.	11.875	7.948	3.823	2.760	Sept.	10.160	4.075	2.524	2.485
Mar.	12.135	7.595	3.822	2.047	Oct.	9.620	4.023	2.898	—
Apr.	10.490	7.391	3.082	1.876	Nov	8.442	4.440	2.890	—
May	10.717	6.926	3.035	1.825	Dec.	7.958	4.516	3.115	—
June	10.580	6.195	3.082	1.750	Average for				
July	11065	5.648	3.048	1.875	Year	10.291	5.926	3.155	—

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Aug.	Sept.	Oct.	Day of Month	Aug.	Sept.	Oct.	Day of Month	Aug.	Sept.	Oct.
1	6.05	8.30	7.05	11	7.15	—	6.80	21	—	—	7.50	6.30
2	5.90	8.75	—	12	7.15	7.75	—	22	7.75	7.55	6.25
3	5.90	8.90	7.15	13	7.35	7.40	6.45	23	7.80	7.35	—
4	5.90	—	7.15	14	—	7.25	6.55	24	8.30	7.45	6.20
5	6.00	—	7.10	15	7.50	7.25	6.50	25	8.45	—	6.25
6	6.20	8.95	7.05	16	7.55	7.05	—	26	8.65	7.50	6.40
7	—	7.00	7.05	17	7.45	6.80	6.35	27	9.20	7.50	6.45
8	7.05	7.95	6.65	18	7.60	—	6.35	28	—	7.40	6.35
9	7.00	8.10	—	19	7.50	6.90	6.45	29	9.20	7.00	6.20
10	7.51	8.10	6.45	20	7.60	6.95	6.35	30	8.70	7.25	—
								31	8.40	—	6.15

Average Monthly Price Per Pound

Month	1929 Cents	1930 Cents	1931 Cents	1932 Cents	Month	1929 Cents	1930 Cents	1931 Cents	1932 Cents
Jan.	20.22	17.21	10.27	6.65	Aug.	18.62	12.03	7.21	7.43
Feb.	20.21	15.62	10.96	6.85	Sept.	18.83	10.85	6.52	7.68
Mar.	20.19	15.13	10.90	6.86	Oct.	18.46	10.63	6.32	6.30
Apr.	20.29	16.39	10.19	6.16	Nov.	17.53	10.96	6.44	—
May	19.41	16.43	9.38	5.72	Dec.	17.28	10.02	6.24	—
June	18.74	14.48	9.05	5.22	Average for				
July	18.62	13.10	9.28	5.87	Year	19.03	13.57	8.56	—

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1930	ON HAND 1931	ON HAND 1932	AFLOAT 1930	AFLOAT 1931	AFLOAT 1932	ON HAND AND AFLOAT 1930	ON HAND AND AFLOAT 1931	ON HAND AND AFLOAT 1932
Jan.	131,744	209,487	322,860	61,863	56,187	42,234	193,607	265,674	365,094
Feb.	143,863	212,833	322,117	63,404	63,680	51,728	207,267	276,513	373,845
Mar.	141,843	217,804	334,566	63,646	63,133	44,190	205,489	280,937	378,756
Apr.	148,272	228,382	343,099	63,261	56,700	40,387	211,533	285,082	383,486
May	146,149	220,799	346,231	63,168	73,564	50,453	214,347	294,363	396,684
June	151,551	225,536	345,702	58,657	69,421	43,079	210,209	294,957	388,781
July	152,001	234,822	345,927	58,326	66,873	37,894	210,327	301,695	383,821
Aug.	158,604	240,816	357,342	61,168	61,469	41,282	219,772	302,285	398,624
Sept.	169,927	254,324	365,789	60,923	62,420	46,188	230,851	316,744	411,977
Oct.	185,470	278,456	——	51,122	68,427	——	236,593	341,883	——
Nov.	189,925	292,493	——	52,538	77,443	——	242,463	369,936	——
Dec.	200,998	322,826	——	56,035	53,940	——	257,033	376,766	——

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1930	1931	1932	At end of	1930	1931	1932
Jan.	60,434	81,093	67,166	July	81,048	81,317	48,842
Feb.	64,557	82,265	65,942	Aug.	80,931	81,560	47,079
Mar.	68,923	84,736	64,280	Sept.	83,329	79,692	44,942
Apr.	74,676	86,982	61,848	Oct.	77,647	76,778	——
May	77,312	86,726	56,089	Nov.	76,887	73,911	——
June	80,260	83,071	51,009	Dec.	78,013	69,470	——

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1932					
January	69,504	68,967	68,272	67,545	67,157
February	67,410	67,824	67,314	65,923	
March	65,459	65,121	65,014	64,461	
April	63,813	64,015	63,717	63,348	61,850
May	61,411	58,101	58,606	56,504	
June	55,535	54,636	52,636	51,785	
July	50,656	50,188	49,327	49,105	48,833
August	48,980	47,713	46,985	47,052	
September	46,982	45,325	46,176	44,986	
October	44,972	44,503	43,729	43,173	42,614

Stocks in Liverpool

1932					
January	57,718	57,652	58,662	58,328	58,182
February	59,155	59,874	59,514	59,868	
March	60,288	60,776	60,922	60,775	
April	61,010	60,872	61,302	61,433	61,480
May	61,674	60,909	60,583	60,148	
June	60,119	59,551	58,601	58,441	
July	58,569	58,335	57,622	57,618	57,366
August	58,019	57,762	57,542	57,448	
September	58,080	57,965	58,028	58,004	
October	58,261	58,209	57,831	57,568	57,702

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1929	1930	1931	1932	End of	1929	1930	1931	1932
Jan.	29,617	39,727	48,802	48,850	July	38,859	45,459	51,203	17,017
Feb.	32,373	44,371	49,283	46,954	Aug.	30,834	48,132	48,971	20,649
Mar.	29,437	45,657	49,590	46,591	Sept.	32,138	44,015	47,025	20,415
Apr.	26,474	48,473	45,868	39,668	Oct.	33,770	39,930	52,132	——
May	30,764	44,715	44,278	38,690	Nov.	30,963	41,674	46,497	——
June	30,403	42,451	47,517	19,770	Dec.	35,548	45,963	45,795	——

STOCKS IN OTHER CENTRES

End of 1932:	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Jan.	43,938	19,090	3,065	3,956	6,342
Feb.	43,695	18,920	3,093	3,591	6,641
Mar.	43,329	17,470	3,172	3,172	6,378
Apr.	42,642	15,660	3,404	3,407	6,469
May	45,422	17,870	3,427	3,768	6,438
June	43,994	20,240	3,274	3,727	5,885
July	44,599	21,900	2,996	3,781	5,982
Aug.	41,974	20,000	2,625	3,347	5,829
Sept.	40,126	20,000			

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.9	1929	24,141,502	80.3
1926	24,199,524	78.9	1930	17,364,096	80.1
1931			**1931**		
January	681,301	67.9	July	812,642	74.0
February	1,010,774	73.9	August	924,236	80.8
March	1,425,336	81.4	September	504,879	70.4
April	1,717,652	79.9	October	281,749	62.7
May	1,508,349	83.7	November	638,138	78.0
June	1,084,707	77.9	December	714,037	80.1
1932			**1932**		
January	810,759	89.0	July	338,725	82.2
February	726,172	84.3	August	221,913	53.8
March	648,013	81.6	September	197,999	64.5
April	652,126	69.8	October	237,498	77.7
May	657,995	74.0	November		
June	499,441	82.3	December		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1924	1925	1926	1927	1928	1929	1930	1931
Production	51,633	60,845	61,237	64,439	77,944	68,726	50,965	48,739
Shipments	50,120	59,262	59,002	64,059	74,296	69,395	53,638	48,151
Inventory[2]	7,427	8,142	10,456	10,264	13,624	11,838	9,003	110,233

Figures for Recent Months

	PRODUCTION 1930	PRODUCTION 1931	PRODUCTION 1932	SHIPMENTS 1930	SHIPMENTS 1931	SHIPMENTS 1932	INVENTORY 1930	INVENTORY 1931	INVENTORY 1932
Jan.	4,485	3,675	3,462	4,406	3,744	3,253	11,925	8,957	7,912
Feb.	4,555	3,985	3,871	4,195	3,402	2,553	11,410	9,536	9,172
Mar.	4,863	4,663	3,671	4,717	4,122	2,954	12,513	10,014	9,878
Apr.	5,648	4,944	3,517	5,089	4,932	3,698	13,076	10,031	9,846
May	5,717	5,679	3,820	5,216	5,415	4,258	13,432	10,312	9,379
June	5,122	5,672	5,643	5,294	5,572	10,367	13,277	10,447	4,625
July	3,991	4,926	3,617	5,447	5,462	2,404	11,812	9,919	6,203
Aug.	4,166	3,906	3,089	5,175	4,960	2,655	10,848	8,896	6,659
Sept.	3,365	3,172	——	4,405	3,932	——	9,812	8,158	——
Oct.	3,582	2,974	——	3,499	2,852	——	9,803	8,300	——
Nov.	2,654	2,500	——	2,834	2,887	——	9,595	7,919	——
Dec.	2,814	2,643	——	3,361	2,871	——	9,003	7,744	——

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1924	1925	1926	1927	1928	1929	1930	1931
Production	70,706	82,614	76,618	70,823	80,180	68,829	52,420	48,333
Shipments	68,106	81,004	71,591	72,896	77,127	70,592	54,938	50,021
Inventory[2]	11,052	11,313	16,200	13,692	16,117	12,807	9,999	112,121

Figures for Recent Months

	PRODUCTION 1930	PRODUCTION 1931	PRODUCTION 1932	SHIPMENTS 1930	SHIPMENTS 1931	SHIPMENTS 1932	INVENTORY 1930	INVENTORY 1931	INVENTORY 1932
Jan.	4,607	3,623	3,308	4,857	4,062	3,529	12,704	9,439	7,719
Feb.	4,634	3,916	3,821	4,337	3,400	2,728	13,036	9,921	8,760
Mar.	4,941	4,450	3,502	4,727	3,789	2,686	13,179	10,475	9,448
Apr.	5,510	4,617	3,225	4,848	4,636	3,385	13,784	10,413	9,441
May	5,535	5,413	3,409	5,074	5,281	3,867	13,852	10,549	8,913
June	4,950	5,358	5,279	5,265	5,397	9,243	13,612	10,504	4,929
July	3,939	4,955	——	5,855	5,831	——	11,657	9,589	——
Aug.	4,796	4,435	——	5,762	5,301	——	10,737	8,774	——
Sept.	3,817	3,449	——	4,541	4,150	——	10,065	8,095	——
Oct.	3,951	3,077	——	3,472	2,813	——	10,517	8,321	——
Nov.	2,680	2,443	——	2,788	2,594	——	10,313	8,119	——
Dec.	3,060	2,597	——	3,412	2,767	——	9,999	7,922	——

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	United States Passenger Cars	United States Trucks	Canada Total	Canada Passenger Cars	Canada Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931							
Jan.	171,848	138,317	33,531	6,496	4,552	1,944	178,344
Feb.	219,940	180,419	39,521	9,871	7,529	2,342	229,811
Mar.	276,405	231,244	45,161	12,993	10,483	2,510	289,398
Apr.	336,939	285,693	50,015	17,159	14,043	3,116	354,098
May	317,163	269,420	45,695	12,738	10,621	2,117	329,901
June	250,640	208,158	41,304	6,835	5,583	1,252	257,475
July	218,490	183,107	35,854	4,220	3,151	1,069	222,710
Aug.	187,197	155,425	31,772	4,544	3,426	1,118	191,741
Sept.	140,566	109,228	31,338	2,646	2,108	538	143,212
Oct.	80,142	58,415	21,727	1,440	761	679	81,582
Nov.	68,867	49,184	19,683	1,247	812	435	70,114
Dec.	121,533	97,897	23,636	2,432	408	2,024	123,965
Total	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932							
Jan.	119,344	98,785	20,541	3,731	3,112	619	123,075
Feb.	117,418	94,110	23,308	5,477	4,494	983	126,621
Mar.	118,959	99,399	19,560	8,318	6,604	1,714	127,277
May	185,149	157,756	27,933	8,221	7,269	952	193,370
June	183,092	160,330	27,754	7,112	6,308	804	190,204
July	111,139	94,705	16,434	7,472	6,773	699	118,611
Aug.	90,324	75,907	14,417	4,067	3,166	901	94,391
Sept.	84,141	64,748	19,393	2,342	1,741	601	86,483

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[3]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[4]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931:															
Jan.	41,579	11,029	30,550	7,039	1,315	770	542	424	5,923	7,348	10,328	1,218	994	295	66,746
Feb.	41,951	9,672	32,279	6,365	1,041	945	542	409	4,869	7,206	9,001	1,018	1,271	217	65,163
Mar.	48,589	12,009	36,580	5,881	1,209	930	542	536	5,434	7,104	11,258	1,233	1,338	430	72,475
Apr.	43,453	9,977	33,476	4,333	641	788	455	340	6,473	6,063	8,759	327	629	333	62,617
May	44,281	10,479	33,802	4,242	622	869	455	413	7,373	6,799	10,955	793	1,110	322	67,815
June	39,397	12,115	27,282	5,098	1,086	1,138	455	337	5,856	6,696	11,380	1,019	621	351	61,319
July	43,658	11,995	31,663	4,517	715	801	536	316	6,671	7,511	10,711	859	1,565	186	66,051
Aug.	42,832	9,063	33,769	3,763	406	692	535	210	6,397	7,044	8,641	1,097	856	241	63,651
Sept.	44,336	8,369	35,967	4,029	169	701	535	218	5,577	7,358	8,389	917	745	183	64,788
Oct.	45,911	9,955	35,956	5,547	286	872	500*	338	8,086	7,882	9,547	934	1,284	238	71,467
Nov.	48,012	9,529	38,483	4,609	408	830	500*	390	7,351	8,174	7,981	731	872	233	70,562
Dec.	35,741	11,314	24,427	6,346	572	1,115	500*	287	5,942	8,562	9,059	1,550	836	203	59,399
1932:															
Jan.	44,538	10,304	34,234	4,570	732	756	500*	457	5,155	8,815	8,703	1,248	831	199	66,200
Feb.	42,008	8,008	34,000	4,472	803	696	500*	334	4,814	6,011	6,325	1,096	352	203	59,606
Mar.	39,903	6,658	33,245	3,405	284	501	500*	217	4,946	6,863	6,252	928	715	77	57,933
Apr.	36,670	4,682	31,988	3,046	365	459	500*	130	6,722	6,090	4,856	913	487	99	55,655
May	40,297	5,677	34,620	4,140	304	595	500*	118	6,552	6,551	6,013	949	416	278	61,036
June	36,566	5,665	30,901	3,620	359	481	500*	166	5,610	7,516	5,507	1,231	394	139	56,424
July	40,723	5,346	35,377	3,125	99	442	500*	184	5,779	6,257	6,145	974	232	141	59,255
Aug.	39,367	7,371	31,996	5,585	129	506	500*	300	4,803	4,882	7,244	1,164	303	140*	57,552
Sept.	41,973	8,869	33,104	4,361		614	500*	410				1,632			

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 98 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931:															
Jan.	34,873	9,730	5,954	3,847	1,709	2,861	1,036	1,775	601	986	348	464	240	635	65,059
Feb.	32,572	12,226	4,510	3,374	1,927	3,264	1,393	1,022	495	785	157	476	201	366	62,768
Mar.	37,960	12,335	4,386	3,545	3,012	2,323	418	2,531	435	862	346	400	392	507	69,452
Apr.	42,212	9,440	4,346	3,054	2,070	3,478	528	1,450	457	515	333	495	208	324	68,910
May	38,271	8,212	2,880	3,231	2,748	3,755	1,023	1,034	884	1,153	86	495	180	711	58,663
June	43,730	5,636	4,002	3,504	2,112	2,988	1,462	3,279	1,112	1,058	272	577	207	607	70,546
July	42,293	5,366	3,301	3,226	2,592	3,065	809	3,141	627	1,507	41	429	145	1,074	67,816
Aug.	36,709	5,030	3,393	2,889	2,304	3,780	912	3,137	283	955	—57	321	160	413	60,129
Sept.	37,571	5,468	4,420	4,227	1,535	5,556	693	2,335	269	1,015	191	571	99	499	64,449
Oct.	39,820	5,775	3,909	3,220	1,567	3,980	571	4,076	765	792	185	710	193	695	66,258
Nov.	43,659	2,550	2,669	2,621	1,233	3,340	545	2,417	934	729	183	745	297	954	62,876
Dec.	51,323	4,402	2,696	2,950	2,452	5,093	859	4,474	787	652	135	677	283	932	77,715
1932:															
Jan.	32,028	3,248	2,588	3,303	1,746	5,782	627	3,258	622	521	479	840	462	197	55,701
Feb.	26,483	5,930	2,898	4,356	1,723	6,781	1,189	2,931	758	506	500	708	313	306	55,382
Mar.	43,361	3,585	2,482	3,436	2,588	5,398	1,423	2,745	1,211	721	112	456	359	644	68,521
Apr.	36,326	6,826	2,956	3,737	1,600	3,684	1,083	764	1,549	847	348	474	417	1,259	61,870
May	32,818	1,110	2,277	3,447	1,416	3,917	1,033	3,743	2,048	617	286	707	272	350	54,041
June	39,136	1,853	3,666	3,405	2,834	2,834	1,534	5,291	1,421	449	127	578	196	280	63,604
July	30,494	4,681	3,125	3,380	1,529	2,544	1,116	1,735	624	723	—214	784	258	1,207	51,386
Aug.	32,650	6,672	4,919	4,006	970	3,390	1,615		751		—66	611	210	557	
Sept.	26,865	5,688		3,674		5,878									

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics	Rubber Heels	Rubber Soles	Mechanical Goods Shipments
	Yards	Pairs	Pairs	Dollars
1924	25,020,000	186,279,000	(1)	$43,615,000
1925	23,983,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1930	42,681,000	178,059,000	29,514,000	58,465,000
1931	36,973,000	176,406,000	34,017,000	41,885,000
1932:				
January	2,184,000	12,317,000	3,411,000	2,463,000
February	2,448,000	14,487,000	3,461,000	2,446,000
March	2,463,000	16,368,000	3,953,000	2,638,000
April	2,092,000	11,787,000	2,292,000	2,613,000
May	1,748,000	10,259,000	2,488,000	2,542,000
June	2,243,000	11,299,000	2,461,000	2,672,000
July	2,013,000	9,868,000	2,419,000	2,024,000
Aug.	2,952,000	11,073,000	2,599,000	2,152,000
September				

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Liquid Latex (1)	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	—	—
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	—	—
1921	58	26,945	814	1,077,859	1,745	351,893	—	—
1922	127	57,040	812	978,765	2,335	403,812	—	—
1923	1,155	542,227	700	895,524	4,565	853,308	—	—
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	2,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	5,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1931:								
July	—	—	67	20,777	331	64,493	583	104,868
Aug.	—	—	73	30,207	652	100,536	364	60,358
Sept.	—	—	126	35,174	407	65,232	439	72,443
Oct.	—	—	100	13,846	415	75,219	267	43,238
Nov.	—	—	36	11,539	276	50,062	265	40,649
Dec.	—	—	93	37,815	643	62,657	282	41,771
1932:								
Jan	—	—	54	14,095	633	81,396	331	40,613
Feb.	—	—	100	24,702	558	84,914	439	52,183
Mar.	—	—	114	20,628	460	59,299	391	44,585
Apr.	—	—	46	10,909	317	44,165	551	46,397
May	—	—	42	9,863	566	68,028	141	27,449
June	—	—	38	9,483	330	47,077	309	28,800
July	—	—	26	7,934	372	52,116	218	37,327
Aug.	—	—	36	8,885	367	46,926	540	59,178
Sept.	—	—	11	2,261	216	27,265	297	46,380

(1) Latex import figures not available before 1924.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

		Consumption					Consumption		
Year	Production	Tons	% to Crude	Stocks*	Year	Production	Tons	% to Crude	Stocks*
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,334	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	18,208	1930	157,967	153,497	40.8	22,000
1931:									
Jan.	10,349	10,728	37.6	22,429	July	11,393	11,447	35.8	17,720
Feb.	10,871	10,800	37.5	18,878	Aug.	10,110	9,972	36.2	17,165
Mar.	12,988	12,524	38.3	18,575	Sept.	9,629	8,932	37.6	17,226
Apr.	13,267	11,745	35.0	18,356	Oct.	9,482	8,126	36.6	17,741
May	13,478	13,103	34.6	18,088	Nov.	7,892	7,492	32.6	17,662
June	14,066	13,045	34.4	18,505	Dec.	8,876	6,812	31.8	19,257
1932:									
Jan.	8,753	8,440	30.2	18,712	July	5,417	5,131	18.1	16,333
Feb.	8,731	8,332	27.7	18,659	Aug.	3,264	4,382	18.6	14,629
Mar.	8,613	7,420	26.7	19,721	Sept.	5,308	5,235	23.2	14,059
Apr.	5,861	5,555	21.6	21,525	Oct.				
May	5,024	6,070	20.8	18,889	Nov.				
June	5,923	7,031	18.0	16,870	Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.

(Rubber Manufacturers' Association figures raised to 100%)

REVIEW DESK

Books, New Publications, Catalogues, Etc.

EFFECT OF OVERMILLING ON COMPOUNDED RUBBER. By W. B. Wiegand. Reprinted from *I. R. I. Transactions*, Vol. VII, No. 6., 7 pp. 1932.

The pamphlet covers the paper presented at the special meeting of the London Section of the Institution of the Rubber Industry in London, on July 10, 1931. The general conclusions drawn are that pigment dispersions need prolong mastication at a low temperature and without organic accelerators; that too long a period of mixing will have its effect on the tensile strength, and the mixing of carbon black with cooling or rest periods and then added the other ingredients, would seem desirable.

INFLUENCE OF TEMPERATURE ON THE EVOLUTION OF HYDROGEN SULPHIDE FROM VULCANIZED RUBBER. By A. D. Cummings. U. S. Bureau of Standards. Research Paper No. 464. Government Printing Office, Washington, D. C., 1932, 12 pp. 5 cents.

The pamphlet presents the results of measurements of the evolution of hydrogen sulphide from rubber sulphur compounds heated at various temperatures. The data presented confirm previous results on the subject and indicate at what temperatures direct thermal decomposition of different rubber-sulphur compounds will become significant.

RUBBER EXCHANGE OF NEW YORK, INC. 7th Annual Report, 1932. 14 pp.

A resume of this report and a summary of the activities of the Rubber Exchange during the last year, together with the announcement of the election of the new officers of the Exchange for the ensuing year was given in the October 25 issue of THE RUBBER AGE.

THE DEVELOPMENT OF AMERICAN INDUSTRIES. Their Economic Significance. Edited by John G. Glover and William B. Cornell, School of Commerce, Finance and Accounts, New York University. Published by Prentice-Hall, Inc., New York. 1932. 932 pp. $5.00.

This comprehensive work is an authoritative and adequate treatment of thirty-nine major industries in the United States. In general, each industry taken up in the volume, has been treated in a similar manner, including its early history, discoveries and operations, growth of the industry and the leaders in its field, the geographical location from the standpoint of the important centers of the industry, raw materials used, manufacturing methods, important products, capital invested and other pertinent phases of each industry.

The chapter on the rubber industry by A. C. Grimley, of the Rubber Manufacturers Association, is especially interesting and is a comprehensive survey of the industry to the present day.

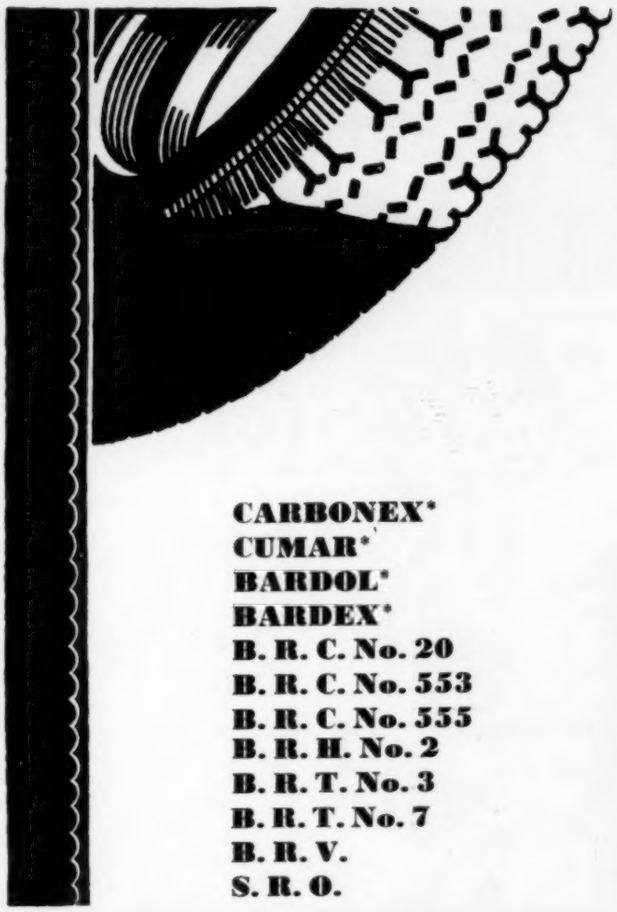
CHEMICAL ENGINEERING CATALOG. Seventeenth Edition. Published by the Chemical Catalog Company, New York City. 1932. 847 pp. $10.00.

Special effort has been exerted to interest manufacturers to include complete catalogues of their products in this volume. The section devoted to equipment is especially complete this year. The current volume contains, as usual, collected, condensed and standardized data on equipment and machinery, laboratory supplies, heavy and fine chemicals, and raw materials with classified indices and a technical and scientific bibliography. As a reference book it finds an indispensable place in the laboratory library of rubber manufacturers.

METHODS OF TEST RELATING TO ELECTRICAL INSULATING MATERIALS. Report of Committee D-9. American Society for Testing Materials. 1932. 236 pp. $1.25.

This publication contains the extensive 1932 report of A. S. T. M. Committee D-9 on Electrical Insulating Materials and all the standard methods of testing insulating materials that have been developed by the Society. There are 29 standards included, of which 18 are test methods promulgated by Committee D-9, 10 are specifications covering rubber and textile products used in the electrical industry, and one is a method of testing the insulating qualities of slate.

Several of the test methods are new ones, accepted by the Society this year, covering laminated tubes, laminated round rods, flexible varnish tubing and pasted mica. The tests for dielectric strength of sheet and tape materials and for power factor and dielectric constant of insulating materials, are included in their revised form. Revised specifications for friction tape for general electrical purposes and rubber insulating tape are given.



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